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PREPARED BY: LM

AUTHORIZED: JR

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1. Introduction

The purpose of this Technical Service Guide is to supply the information necessary to service the following scanner models:

Model	Type	Optical Res.
KA67E	3C36"	600
KC67E	4C42"	600
KD67E	4C54"	508
KE67E	4C42"	600
KF67E	4C42"	600
KH67E	3C36"	600
KK67E	3C36"	600
KL67E	1C25"	424
KM67E	4C42"	600
KN67E	4C54"	508

Note: Throughout this TSG the abbreviation Kx67E will be used when referring to all of the above listed scanner models

The scanner model is identified by the model number on the number plate placed on the back of the scanner

Fig. 1-1, Location of Model Number

2. General Information

2.1 Screws Secured by Sealing Lacquer

Some screws, nuts or the like are sealed by sealing lacquer. The color of the sealing lacquer signals the following:

⚠	RED Lacquer	Factory adjusted. **DO NOT ALTER**
	WHITE Lacquer	Adjustment which may be altered

2.2 Marking Codes for Circuit Boards

All circuit boards are identified by a 4-letter code, where the *fourth* letter designates a specific variant of the board. The board identification code is followed by a board revision number (functional level) and for newer boards also an extra letter in parenthesis. This extra letter is unimportant in this connection.
The marking of all printed circuit boards may be exemplified by the marking of the SUD Board:

SUDA02(B)

which designates SUD Board, variant **A**, revision **02**. The (B) is of no importance and should be neglected.
The *revision number* is updated only if the functionality of the board has been changed. Updated boards will always be backwards compatible.

2.3 Downloading Scanner Firmware

The scanner firmware is stored in Flash Memory on the SUx Board.
Firmware is downloaded to the scanner through the USB 2.0 interface, please refer to any *readme.txt* for download instructions.

The download program is started by double-clicking the self extracting *firmware* file.

It is recommended to disable WIDEsystem before upgrading the firmware to prevent any possible problems caused this program accessing the scanner during the upgrade.

Scanner firmware is available on the support home page.

2.4 Erase and Restore Parameter Blocks

When trouble shooting it may be advisable to clear the parameter blocks in the scanner to reset these to default values.
The parameter blocks can be erased from Scanner Maintenance by right-click on the Title Bar and select Erase Parameter Blocks from the pull-down menu.

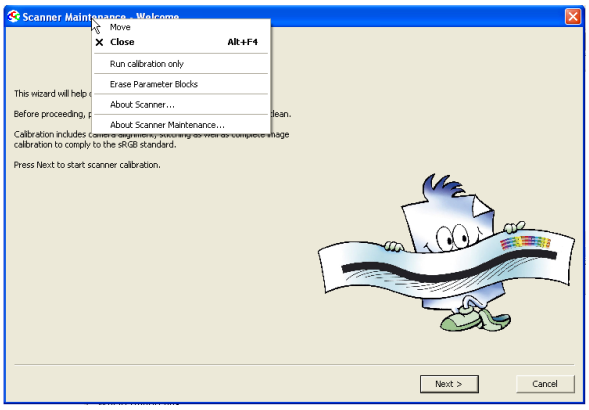


Fig. 2-1, Erase and Restore Parameter Blocks

Note: Always run Scanner Maintenance after Erasing Parameter Blocks.

2.5 Switch Settings

2.5.1 Scanner ID Switch

2.5.1.1 Scanner ID Switch, all except KA67E, KC67E and KM67E

SKD switch settings, see Fig. 3-13, SKD Component Layout:

Scanner Model	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	HEX
KD67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF	0x54
KE67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	0x55
KF67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF	0x56
KH67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	0x58
KK67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	**ON**	0x59
KN67E	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF	**ON**	0x5D

2.5.1.2 Scanner ID Switch, KA67E, KC67E and KM67E only

SKF switch settings ,see Fig. 3-10, SKF Component Layout:

Switch No:	1	2	3	4	5	6	7	8	HEX
KA67E	OFF	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	0x04
KC67E	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**	0x09
KM67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	**ON**	**ON**	0x5B

2.5.2 Smart Card Reader Switch Settings

The switch on the smart card reader has formerly been referred to as the "SCSI ID". As none of the Kx67E scanners have SCSI interface the SCSI related switch settings (SW no. 1, 2, 3, 4, and 5) do not apply to these scanners.

2.5.2.1 CRB, all except KL67E

CRB switch settings, see Fig. 3-17, CRB Component Layout:

Switch No:	1	2	3	4	5	6	7	8
KA67E **KC67E** **KM67E**	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
KD67E **KE67E** **KF67E** **KH67E** **KK67E** **KN67E**	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF

2.5.2.2 SCR, KL67E only

SCR switch settings, see Fig. 3-18, SCR Component Layout:

Switch No:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
KL67E	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF

2.6 Setting Scanner in Boot Mode

The scanner can be set in to boot mode as described in the table below.

Model	**Setting Scanner in Boot Mode**
KA67E* KC67E* KM67E*	fw < 1.2.1: n/a fw ≥ 1.2.1: - Switch off the scanner - Press and hold STOP + ENTER Key - Switch power on - Wait until display reads “Requesting download” - Release STOP + ENTER Keys
* Firmware must be loaded using the USB interface	
KD67E KE67E KF67E KH67E KK67E KL67E KN67E	To set the scanner in boot mode: - Switch off the scanner - Press and hold POWER Key - Switch power on - Wait until scanner blink indicates that scanner is in boot mode - Release POWER Key

2.7 Board Overview

The table below gives an overview of the printed circuit boards used in the different models with reference to the appropriate section in this manual.

Type	Part Number	Designation	Section	KA67E	KC67E	KD67E	KE67E	KF67E	KH67E	KK67E	KL67E	KM67E	KN67E
SMPS	0080A064R01	CTX-Z07H, 68W SMPS, Triple Output	3.1	x	x	x	x	x	x	x	x	x	x
LMFA	6834A001R01	LMFA, Lamp and Motor Driver Board	3.2	x	x	x	x	x	x	x		x	x
LMFB	6834A003R01	LMFB, Lamp and Motor Driver Board	3.2	-	-	-	-	-	-	-	x	-	-
CBKA	6742D001R01	CBKA Camera Board	3.3	x	-	-	-	-	-	-	-	-	-
CBMA	6749D001R01	CBMA Camera Board	3.4	-	x	x	x	x	x	x	-	x	x
CBIB	6733E002R01	CBIB Camera Board	3.5	-	-	-	-	-	-	-	x	-	-
SUDA	6732E001R01	SUDA, Controller Board	3.6	x	-	-	-	-	-	-	-	-	-
SUFB	6748D002RA1	SUFB, Controller Board	3.7	-	-	-	-	-	-	-	x	-	-
SUGA	6736E001R01	SUGA, Controller Board	3.8	-	x	-	-	-	-	-	-	x	-
SUHA	6750D001R01	SUHA Controller Board	3.9	-	-	-	-	x	-	-	-	-	x
SUHB	6750D002R01	SUHB Controller Board	3.9	-	-	x	x	-	-	-	-	-	-
SUHC	6750D003R01	SUHC Controller Board	3.9	-	-	-	-	-	x	-	-	-	-
SUHD	6750D004R01	SUHD Controller Board	3.9	-	-	-	-	-	-	x	-	-	-
IMKC	6845A003R01	IMKC, Interface Module (USB2.0 only)	0	-	-	x	x	x	x	x	-	-	x
IMHA	6746D001R01	IMHA, Interface Module, IEEE 1394 and USB	3.12	-	-	-	-	-	-	-	x	-	-
SKDA	6733D001R01	SKDA, Operator Panel, Contex	3.11	-	-	-	-	-	-	-	x	-	-
SKDG	6733D007R01	SKDG, Operator Panel (Dark Grey)	3.11	-	-	x	x	x	x	x	-	-	x
SKFA	6836A001R01	SKFA, Operator Panel	3.10	x	x	-	-	-	-	-	-	x	-
CRBC	6831A003R01	CRBC, Smart Card Reader	3.15	x	x	x	x	x	x	x	-	x	x
SCRA	6753A104R01	SCR, Smart Card Reader, assembly	3.16	-	-	-	-	-	-	-	x	-	-
MDAC	6738D003R01	MDAC, Elevation Motor Driver Board	3.14	x	x	x	x	x	x	x	-	x	x
OIBA	6336A001R01	OIBA, Optical Interrupter Board	3.18	-	-	-	-	-	-	-	x	-	-
OSBC	3132A003R01	OSBC, Optical Sensor Board	3.17	-	-	-	-	-	-	-	x	-	-

2.8 Block Diagrams

2.8.1 Block Diagram, KA67E

The Block Diagram for the following models is shown below.

Model	Type
KA67E	3C36"

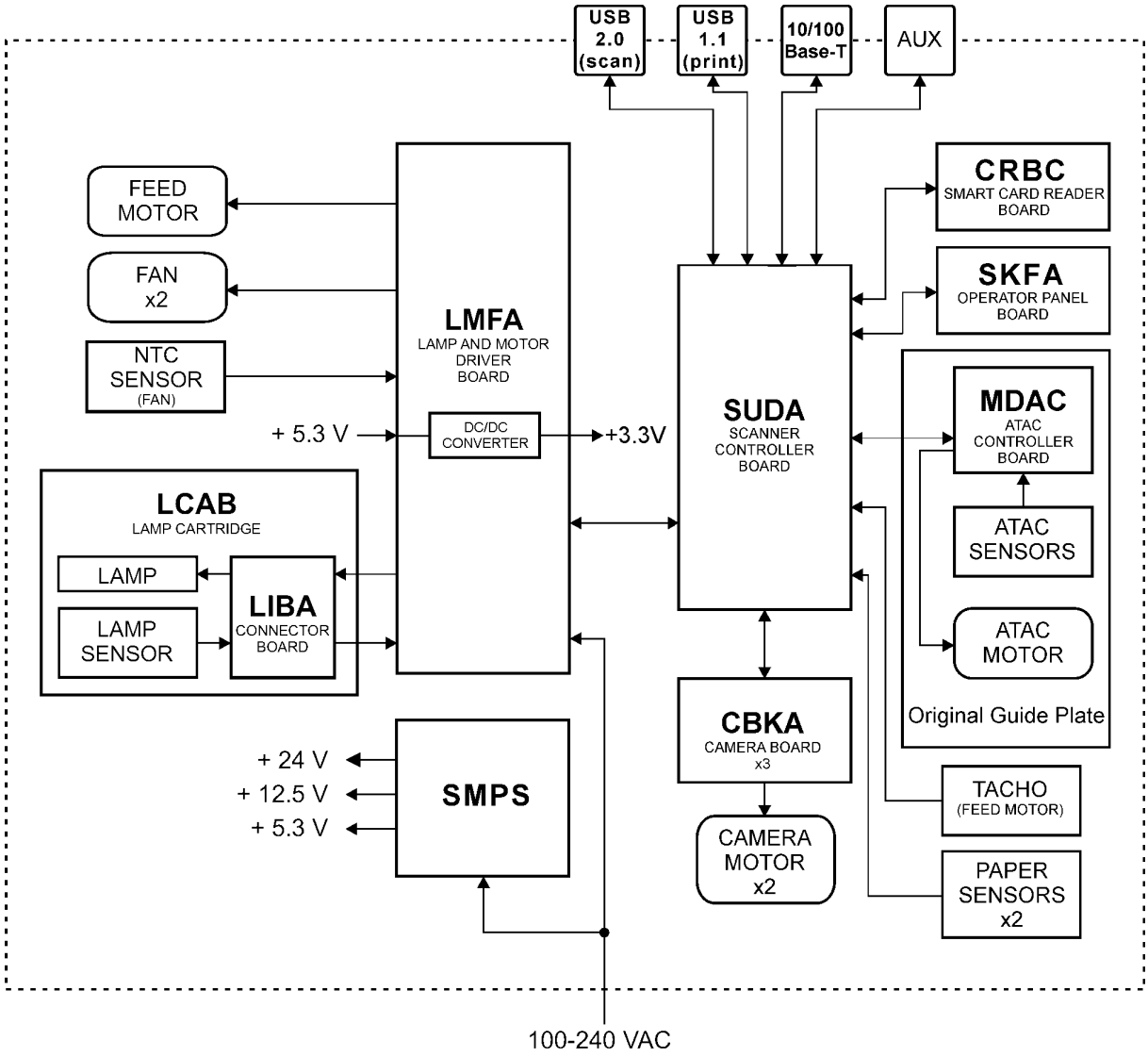


Fig. 2-2, Block Diagram KA67E

2.8.2 Block Diagram, KC67E, KM67E

The Block Diagram for the following models is shown below.

Model	Type
KC67E KM67E	4C42"

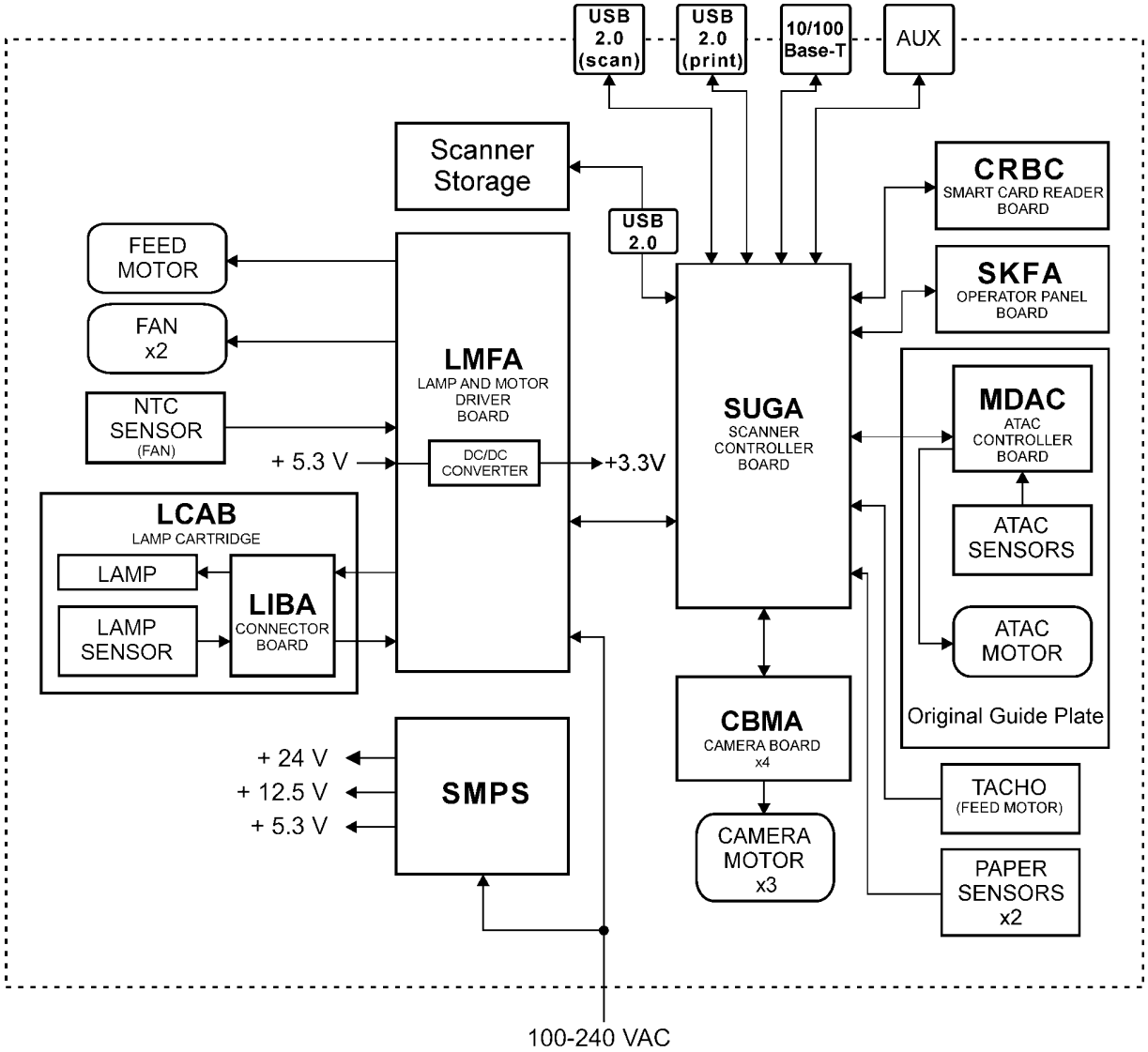


Fig. 2-3, Block Diagram KC67E, KM67E

2.8.3 Block Diagram, KD67E, KE67E, KF67E, KH67E, KK67E, KN67E

The Block Diagram for the following models is shown below.

Model	Type
KD67E KN67E	4C54"
KE67E KF67E	4C42"
KH67E KK67E	3C36"

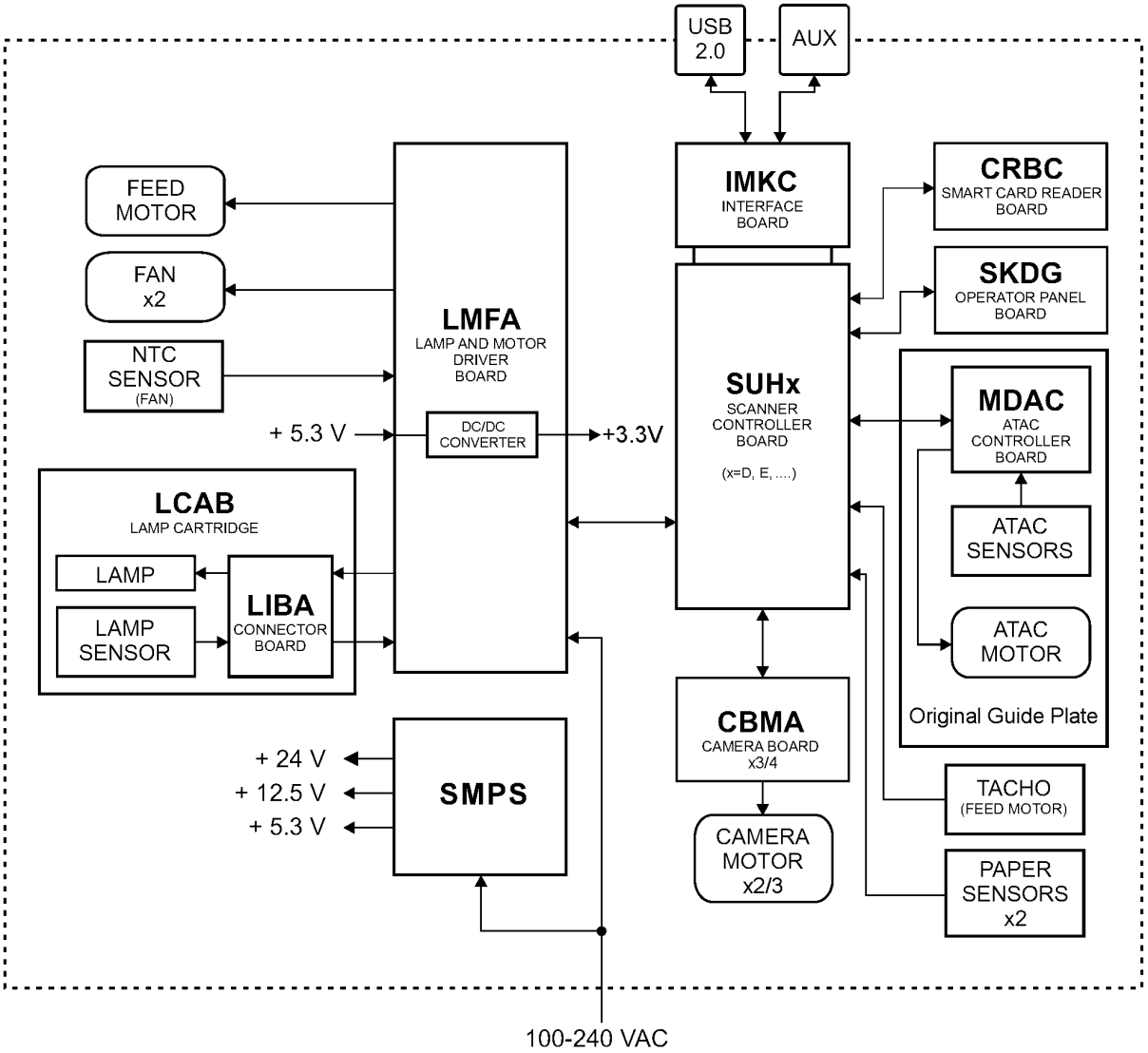


Fig. 2-4, Block Diagram KD67E, KE67E, KF67E, KH67E, KK67E, KN67E

2.8.4 Block Diagram, KL67E

The Block Diagram for the following models is shown below.

Model	Type
KL67E	1C25"

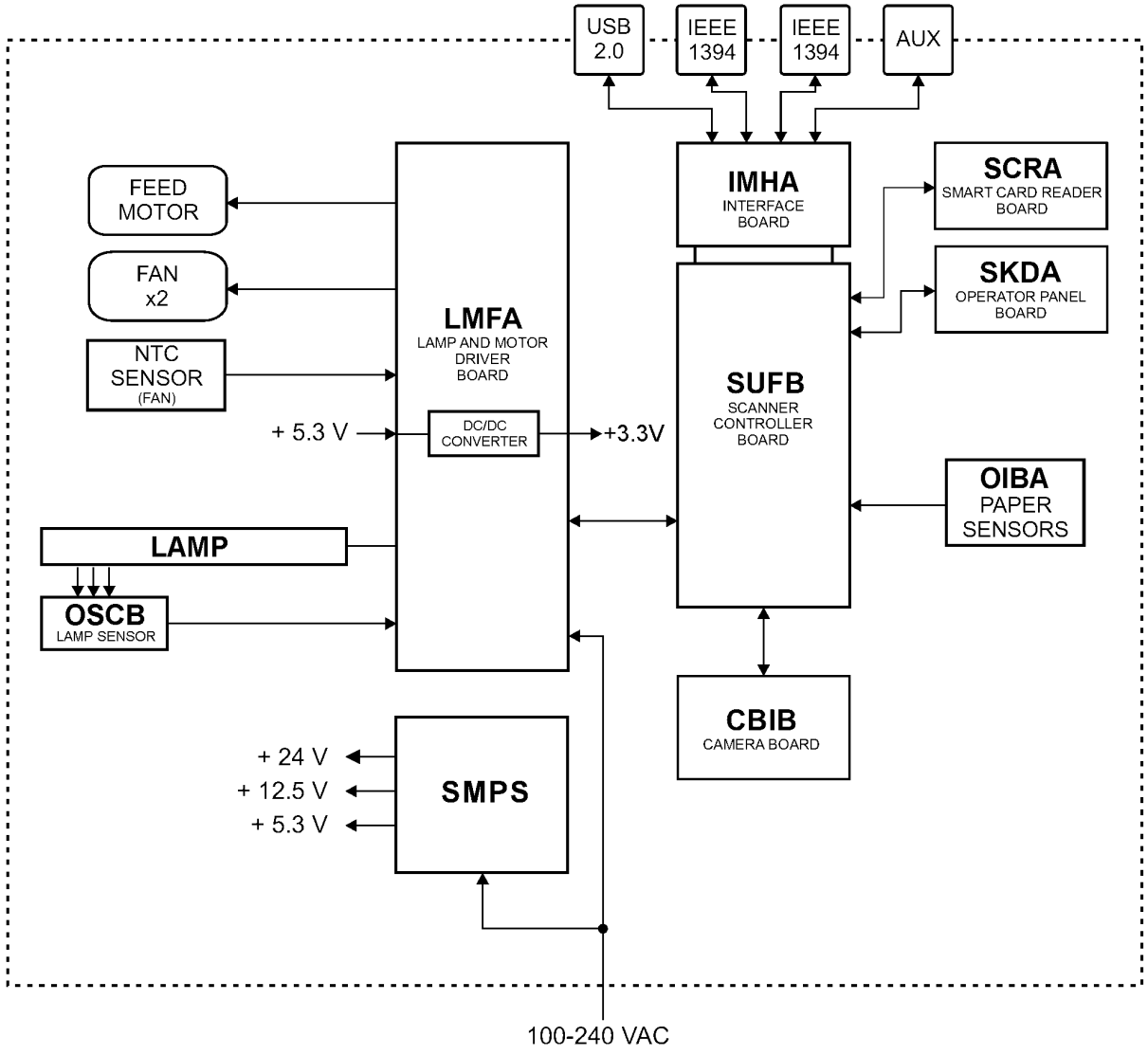


Fig. 2-5, Block Diagram KL67E

3. Electrical Check and Adjustments

Required Test Equipment:

Multimeter, R_i > 10 MOhm

PC with the following installed:

- SCANtest
- Scanner Maintenance
- USB Interface

SCANtest is described in Chapter 6, page 95.

On the following pages tests of the individual printed circuit boards are described as well as the adjustment of various sensors.

3.1 SMPS, Switch Mode Power Supply

3.1.1 AC Voltages

CAUTION: The connector TB1 and the components in the hatched area are connected directly to the mains voltage and constitute a risk of electric shock, or injury to persons

3.1.2 DC Voltages

Ref. on Fig. 3-1	DC Voltage
TB2, pin 1,2	+5.3 V +0/-0.1 V
TB2, pin 3,4,5,6	GND
TB2, pin 7	+12.5 V ± 0.5 V
TB2, pin 8	+24 V ± 1 V

3.1.3 Adjustments

IMPORTANT: The output voltages of the SMPS are all factory set and should normally not be adjusted.

The 5.3V output voltage should be no more than 5.3 V measured between GND and TB2, pin 1,2 (5.3V) on the SMPS, and no less than 5.1 V measured between GND and D3, bottom on the CBK board. If the voltage is not within these limits, it may be adjusted by potentiometer VR1 on the SMPS.

3.1.4 Fuses

No service replaceable fuses

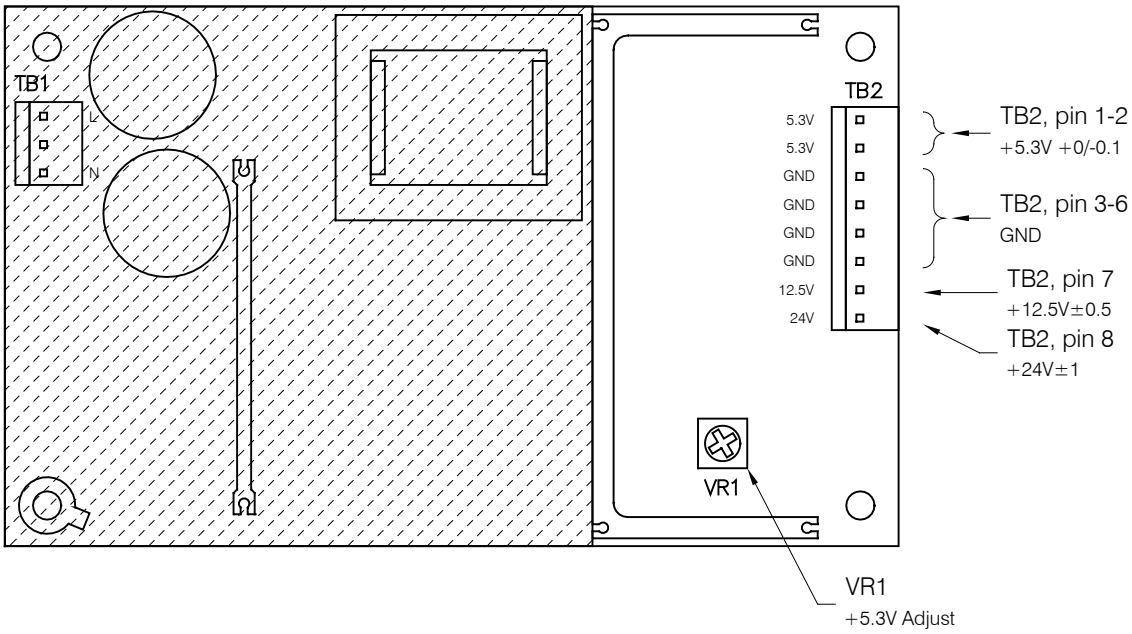


Fig. 3-1, SMPS Component Layout

3.2 LMF, Lamp and Motor Driver Board

All test points referred to below are shown in Fig. 3-2, page 23.
All DC voltages are measured relative to test point GND.

CAUTION: Connectors J1, J7 and all the components in the hatched area are connected to the line voltage and constitute a risk of electric shock, or injury to persons.

3.2.1 DC Voltages

Ref. on Fig. 3-2	DC Voltage
Test point GND	GND
TP8 - GND	+3.3 V ± 0.1 V
TP9 - GND	+5.3 V +0/-0.2 V
TP10 - GND	+12.0 V + 1/-0 V
TP18 - GND	+24.0 V ± 1 V
TP16 - GND	+5.0 V ± 0.15 V
TP15 - GND	+12.0 V ± 0.3 V
TP5 – TP7 *	+200 V ± 20 V
TP7 – TP6*	–200 V ± 20 V

*Caution: These test points are at high voltage level and constitute a risk of electric shock, or injury to persons.

3.2.2 Lamp Driver Adjustment (KL67E only)

For all models except KL67E the LMF board is designed to work with calibrated Lamp Cartridges which means that there is no adjustment of the lamp driver. KL67E does not use a Lamp Cartridge and on this model the lamp driver must be adjusted.

To ensure a constant predefined light level in the scanners throughout the lifetime of the lamp, the lamp driver should *only* be adjusted when the lamp is new. This means that the lamp driver is *only* adjusted when changing either:

- the Lamp
- the Lamp Driver Board, LMF
- the Lamp Sensor Board, OSB

and in order to do so the lamp *must* be new

Adjustment Procedure:

Note: The voltage on TP11 is clamped to approximately 5V. It may be necessary to turn P11 several turns CCW to bring the voltage below the clamp voltage.
The Lamp Driver should be adjusted immediately after the scanner has been switched on and the lamp must be new and “cold”.

1. Make sure that the lamp is new. If not it should be replaced.
2. Remove the front cover of the scanner
3. Switch on the scanner
4. While the scanner boots, wait for the lamp to switch on for the ***second*** time (after approx. 30 seconds)
5. Turn P11 CW until LED1 switches ON and then slowly CCW until LED1 switches OFF
6. Leave the scanner on for 1 minute

7. Turn P11 CW until LED1 switches ON and then slowly CCW until LED1 switches OFF
8. Replace the front cover
9. Reset the lamp counter:
   - Start SCANtest
   - Select Test 1 (Scanner Information)
   - Press the button “Reset Lamp Counter”
   - Type the password “xetnoc” and press “Reset Lamp Counter”
10. Run Scanner Maintenance to ensure correct Basic- and Color Calibration

3.2.3 Signal LED's on the LMF Board

The two indicators, LED1 and LED2 indicate the status of the stabilization circuit of the Lamp Driver and are controlled by the feedback voltage on TP11. The following can be read from the status of the LED's:

LED1: The status of this LED is of no importance.

LED2: ON: Stabilization circuit is close to or outside the active range and the lamp should be replaced

OFF: Stabilization circuit within the active range

3.2.4 Stepper Motor Driver

There are no adjustments to the Stepper Motor Driver on the LMF board

3.2.5 Functional Tests

SCANtest: Test 5, Lamp Test
Test 6, Motor Test

3.2.6 Fuses

The type and rating of the fuse on the LMFA board is:

F1: T2.0AH/250V, type IEC 127- 2/5, UL R/C

IMPORTANT:
For continued protection against risk of fire, replace only with same type and rating of fuse.

3.2.7 Markings

KA67E	LMFAdd
KC67E	LMFAdd
KD67E	LMFAdd
KE67E	LMFAdd
KF67E	LMFAdd
KH67E	LMFAdd
KK67E	LMFAdd
KL67E	LMF**B**dd
KM67E	LMFAdd
KN67E	LMFAdd
where dd = board revision number.	

3.2.8 Jumper Settings

Jumper:	JP1
	not installed

3.2.9 Hints

Jumper on JP1: Not installed: Lamp controlled by SUF
Installed: Lamp constant ON

Control signals on J6:

pin 2: Lamp ON/OFF, LOW = ON
pin 8: Feed-Motor Step Pulse
pin 11: Feed-Motor Direction, LOW = FORWARD

Fan Speed Control:
A NTC Temperature Sensor located under the End Cover at the Operator Panel end of the scanner controls the speed of the fans connected to J13 and J14.

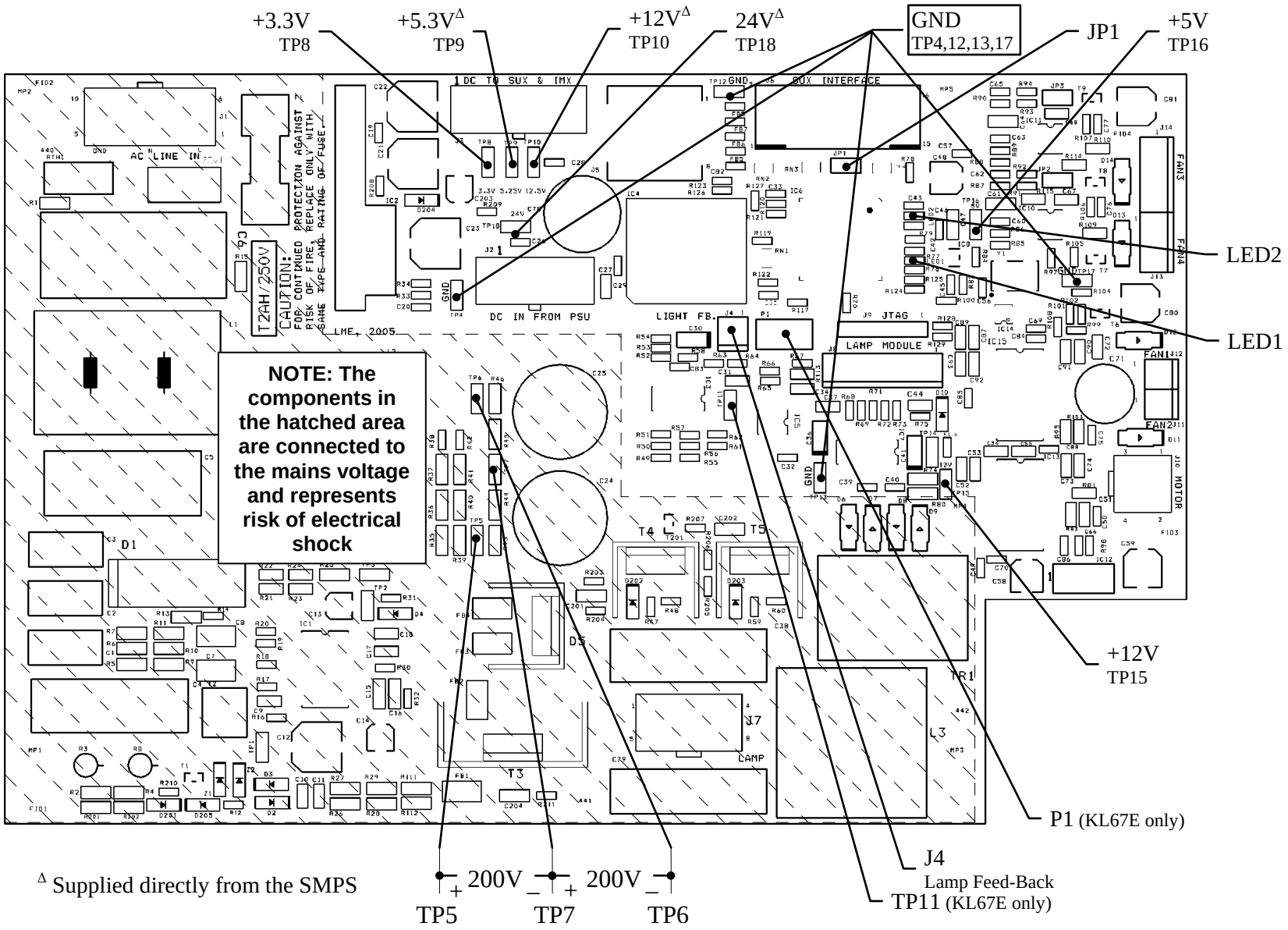


Fig. 3-2, LMF Component Layout

3.3 CBK, Camera Board (KA67E only)

All test points referred to are shown in Fig. 3-3, page 24.
All voltages are measured relative to test point GND.

3.3.1 DC Voltages

Ref. on Fig. 3-3	DC Voltage	Remarks
D3, bottom	+5.3 V +0/-0.2 V	From SUx / SMPS
D3, top	+5.0 V ± 0.2 V	Derived from +5.3V
D2, top	+5.0 V ± 0.2 V	Derived from +5.3V
D4, bottom	+12.0 V +1/-0 V	From SUx / SMPS, used for CCD and Camera Motor
D4, top	+11.6 V ± 0.6 V	Derived from +12V
C301, bottom	+3.3 V ± 0.1 V	From SUx / LMF
D308, bottom	+1.8 V ± 0.1 V	Derived from +3.3V

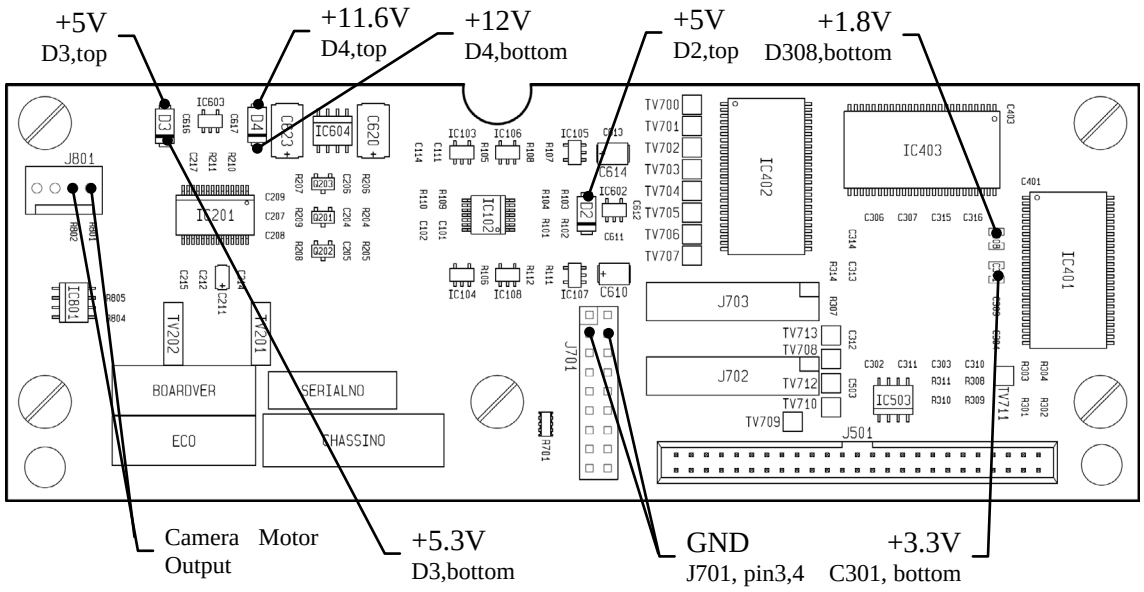


Fig. 3-3, CBK Component Layout

3.3.2 Functional Test

SCANtest: Test 7, Complete Hardware Test
Test 9, Camera Adjustment

3.3.3 Markings

KA67E	CBKAdd
where dd = board revision number	

3.3.4 Hints

+3.3 V is supplied from the LMF via the SUx Board.
+5.3 V and +12 V is supplied from the SMPS via the SUx Board.

CCD
The lines of pixels on the CCD are arranged as follows:

Upper line on the CCD:	Red
2nd line on the CCD:	Green
3rd line on the CCD:	Blue
Lower line on the CCD:	B/W

As the image is mirrored an even number of times (mirror chassis and lens), the Red line remains upper line when referred to the original.

Control of Camera Motor
The Camera Motor for Vertical Alignment is driven from a controller IC on the CBK Board. The supply voltage for the motor is +12 V.
The motor can be tested using test 9, Camera Adjustment (Forward / Reverse controls for the Camera Motor)

After replacement of CBK Board, do:
- CCD-Centering, see 4.4.10.
- Vertical Positioning, see 4.4.11.
- Check Scan-Width, if it is within the limits given in 4.4.9, Focus will also be OK, and no further adjustments are required.
- Run Scanner Maintenance.

These adjustments can be made without loosening the Camera Fixing Screws and without loosening the Focus Lock Ring / Lock Screw.

3.4 CBM, Camera Board (All except KA67E and KL67E)

All test points referred to are shown in Fig. 3-4, page 26.
All voltages are measured relative to test point GND.

3.4.1 DC Voltages

Ref. on Fig. 3-4	DC Voltage	Remarks
D3, bottom	+5.3 V +0/-0.2 V	From SUx / SMPS
D3, top	+5.0 V ± 0.2 V	Derived from +5.3V
D2, top	+5.0 V ± 0.2 V	Derived from +5.3V
D4, bottom	+12.0 V +1/-0 V	From SUx / SMPS, used for CCD and Camera Motor
D4, top	+11.6 V ± 0.6 V	Derived from +12V
C301, bottom	+3.3 V ± 0.1 V	From SUx / LMF
D308, bottom	+1.8 V ± 0.1 V	Derived from +3.3V

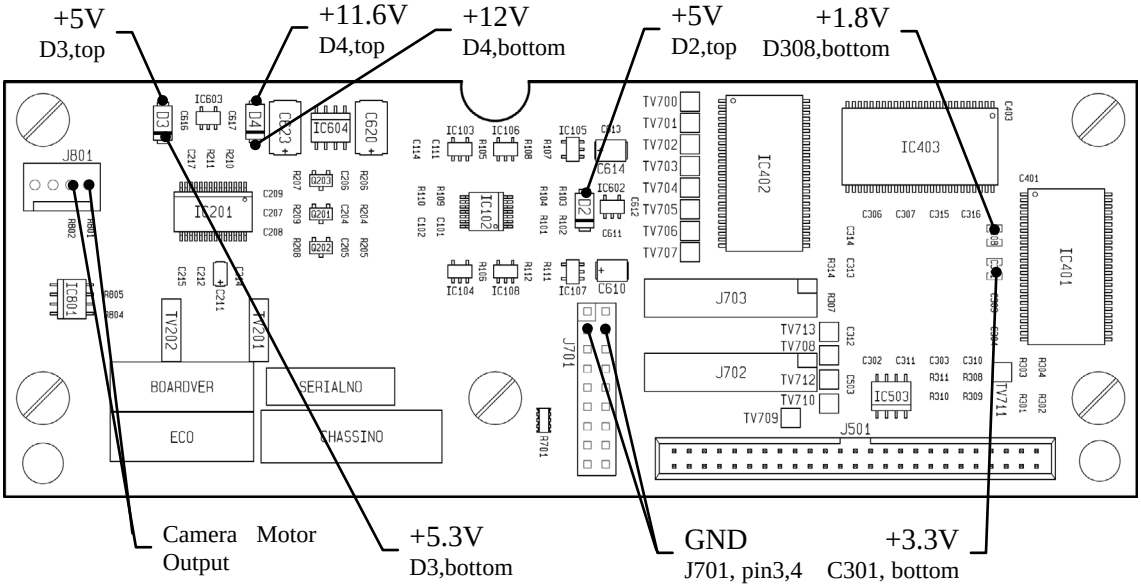


Fig. 3-4, CBM Component Layout

3.4.2 Functional Test

SCANtest: Test 7, Complete Hardware Test
Test 9, Camera Adjustment

3.4.3 Markings

KC67E	CBMAdd
KD67E	CBMAdd
KE67E	CBMAdd
KF67E	CBMAdd
KH67E	CBMAdd
KK67E	CBMAdd
KM67E	CBMAdd
KN67E	CBMAdd
where dd = board revision number	

3.4.4 Hints

+3.3 V is supplied from the LMF via the SUx Board.
+5.3 V and +12 V is supplied from the SMPS via the SUx Board.

CCD
The lines of pixels on the CCD are arranged as follows:

Upper line on the CCD:	Red
2nd line on the CCD:	Green
3rd line on the CCD:	Blue
Lower line on the CCD:	B/W

As the image is mirrored an even number of times (mirror chassis and lens), the Red line remains upper line when referred to the original.

Control of Camera Motor
The Camera Motor for Vertical Alignment is driven from a controller IC on the CBK Board. The supply voltage for the motor is +12 V.
The motor can be tested using test 9, Camera Adjustment (Forward / Reverse controls for the Camera Motor)

After replacement of CBM Board, do:
- CCD-Centering, see 4.4.10.
- Vertical Positioning, see 4.4.11.
- Check Scan-Width, if it is within the limits given in 4.4.9, Focus will also be OK, and no further adjustments are required.
- Run Scanner Maintenance.

These adjustments can be made without loosening the Camera Fixing Screws and without loosening the Focus Lock Ring / Lock Screw.

3.5 CBI, Camera Board (KL67E only)

All test points referred to are shown in Fig. 3-5, page 28.
All voltages are measured relative to test point GND.

3.5.1 DC Voltages

Ref. on Fig. 3-3	DC Voltage	Remarks
D3, bottom	+5.3 V +0/-0.2 V	From SUx / SMPS
D3, top	+5.0 V ± 0.2 V	Derived from +5.3V
D2, top	+5.0 V ± 0.2 V	Derived from +5.3V
D4, bottom	+12.0 V +1/-0 V	From SUx / SMPS, used for CCD
D4, top	+11.6 V ± 0.6 V	Derived from +12V
C301, bottom	+3.3 V ± 0.1 V	From SUx / LMF
D308, bottom	+1.8 V ± 0.1 V	Derived from +3.3V

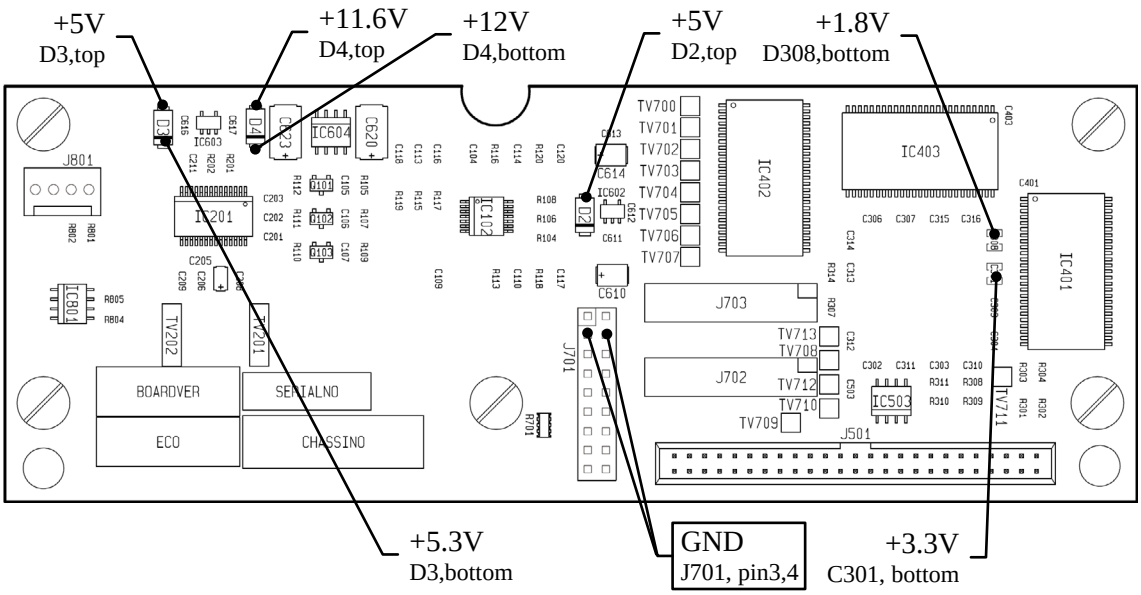


Fig. 3-5, CBI Component Layout

3.5.2 Functional Test

SCANtest: Test 7, Complete Hardware Test

3.5.3 Markings

KL67E	CBIBdd
where dd = board revision number	

3.5.4 Hints

+3.3 V is supplied from the LMF via the SUx Board.
+5.3 V and +12 V is supplied from the SMPS via the SUx Board.

CCD
The lines of pixels on the CCD are arranged as follows:

Upper line on the CCD:	Blue
Center line on the CCD:	Green
Lower line on the CCD:	Red

As the image is mirrored an even number of times (mirror chassis and lens), the Blue line remains upper line when referred to the original.

After replacement of CBI Board, do:

- CCD-Centering, see 4.4.10.
- Vertical Positioning, see 4.4.11.
- Check Scan-Width, if it is within the limits given in 4.4.9, Focus will also be OK, and no further adjustments are required.
- Run Scanner Maintenance

These adjustments can be made without loosening the Camera Fixing Screws and without loosening the Focus Lock Ring / Lock Screw.

3.6 SUD, Scanner Controller Board (KA67E only)

All test points referred to below are shown in Fig. 3-6, page 31.
All voltages are measured relative to test point TP_GND6.

3.6.1 DC Voltages

Ref. on Fig. 3-6	DC Voltage	Remarks
TP+12V_CAM1	+12 V + 1/-0V	Supply for Camera Board, Elevation Motor (ATAC)
TP+5V_CAM1	+5.3 V +0/-0.2 V	Supply for Camera Board, MDA Board (ATAC)
TP+1V5_D	+1.5 V ± 0.1 V	
TP+5V0_D1	+5.1 V +0.1/-0.2 V	Derived from 5.3V
C168+ C184+ C901+ C197+	+1.25V ± 0.1 V	
TP+1V8D	+1.8 V ± 0.1 V	
TP+2V5_D	+2.5 V ± 0.1 V	

3.6.2 Adjustments

No adjustments.

3.6.3 Functional Test

SCANtest: Test 1 Scanner Information
Test 7, Complete Hardware Test

3.6.4 Markings

Note: SUD variant depends on scanner model.

KA67E	SUDAdd
where dd = board revision number.	

3.6.5 Signal LEDs on the SUD Board

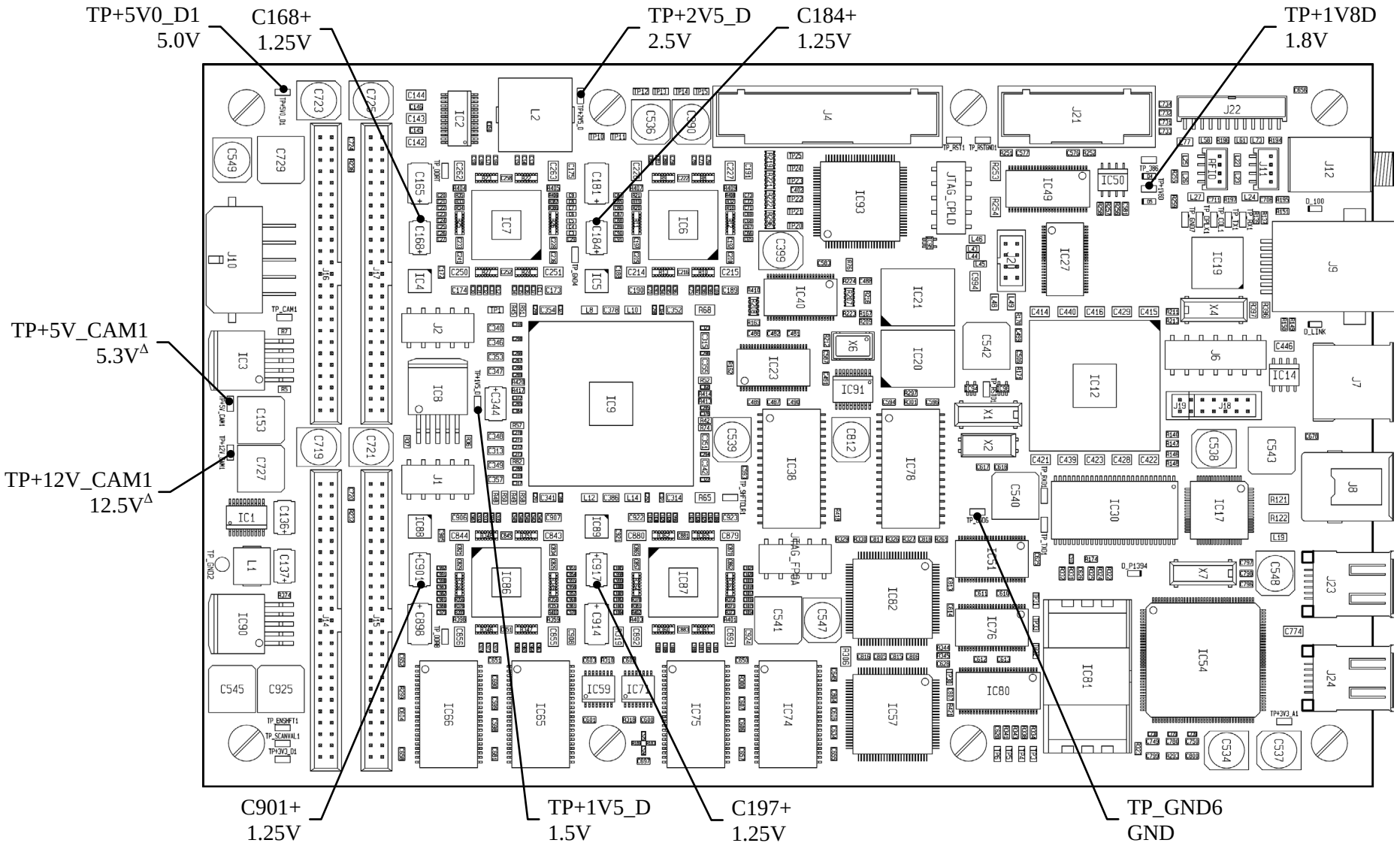
The three signal LEDs on the SUD board are for debugging purposes only. The ON/OFF pattern displayed by these LEDs is not intended for general troubleshooting.

3.6.6 Replacing the SUD Board

When installing a new SUD board the scanner serial number is read from the smart card.
IMPORTANT: You must confirm to use the read number within 30 seconds by pressing the "Enter" key on the operators panel, otherwise the scanner will display an error (100-50303, No serialnumber). In this case either reboot the scanner or use SCANtest to enter the serial number found on the marking label on back of the scanner.

A spare SUD board may not contain the correct firmware. Install the correct firmware from the CD which comes with the board.

After replacement of SUD Board run Scanner Maintenance.



∆ Supplied directly from the SMPS

Fig. 3-6, SUD Component Layout

3.7 SUF, Scanner Controller Board (KL67E only)

All test points referred to below are shown in Fig. 3-7, page 33.
All voltages are measured relative to test point GND2.

3.7.1 DC Voltages

Ref. on Fig. 3-7	DC Voltage	Remarks
12V_CAM	+12 V + 1/-0V	Supply for Camera Board, Elevation Motor (ATAC)
5V_CAM	+5.3 V +0/-0.2 V	Supply for Camera Board, MDA Board (ATAC)
+3	+3.3 V ± 0.1 V	
+5V	+5.1 V +0.1/-0.2 V	Derived from 5.3V on SUF
APEX_SUP	+1.8 V ± 0.1 V	
APEX_PLL	+1.8 V ± 0.05 V	

3.7.2 Functional Test

SCANtest: Test 1 Scanner Information
Test 7, Complete Hardware Test

3.7.3 Markings

Note: SUF variant depends on scanner model.

KL67E	SUFBdd
where dd = board revision number.	

3.7.4 Signal LED's on the SUF Board

The three signal LEDs on the SUF board are for debugging purposes only. The ON/OFF pattern displayed by these LEDs is not intended for general troubleshooting.

3.7.5 Hints

After replacement of SUF board:
As all scanner parameters are stored in the Flash Memory on the SUF board, the following steps should be carried out after replacement of the SUF board:

- Download Firmware
- Run Scanner Maintenance
- Enter Serial Number of scanner into Flash Memory (SCANtest, Test 1). The serial number of the scanner is found on the marking label on back of the scanner

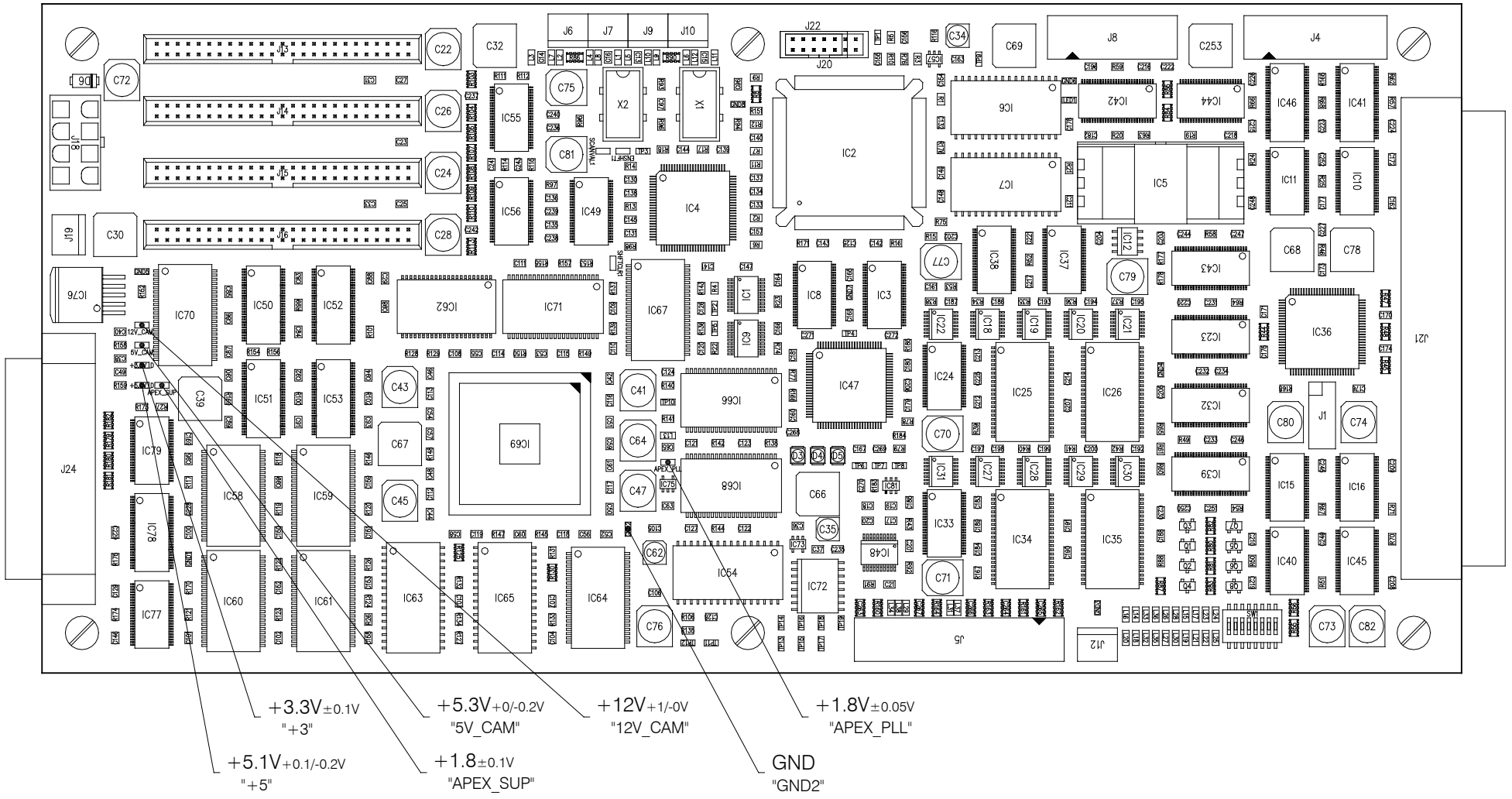


Fig. 3-7, SUF Component Layout

3.8 SUG, Scanner Controller Board (KC67E and KM67E only)

All test points referred to below are shown in Fig. 3-8, page 35.
All voltages are measured relative to test point TP_GND6.

3.8.1 DC Voltages

Ref. on Fig. 3-8	DC Voltage	Remarks
TP+12V_CAM1	+12 V + 1/-0V	Supply for Camera Board, Elevation Motor (ATAC)
TP+5V_CAM1	+5.3 V +0/-0.2 V	Supply for Camera Board, MDA Board (ATAC)
TP+1V5_D	+1.5 V ± 0.1 V	
TP+5V0_D1	+5.1 V +0.1/-0.2 V	Derived from 5.3V
C168+ C184+ C901+ C197+	+1.25V ± 0.1 V	
TP+1V8D	+1.8 V ± 0.1 V	
TP+2V5_D	+2.5 V ± 0.1 V	

3.8.2 Adjustments

No adjustments.

3.8.3 Functional Test

SCANtest: Test 1 Scanner Information
Test 7, Complete Hardware Test

3.8.4 Markings

Note: SUG variant depends on scanner model.

KC67E	SUGAdd
KM67E	SUGAdd
where dd = board revision number.	

3.8.5 Signal LEDs on the SUG Board

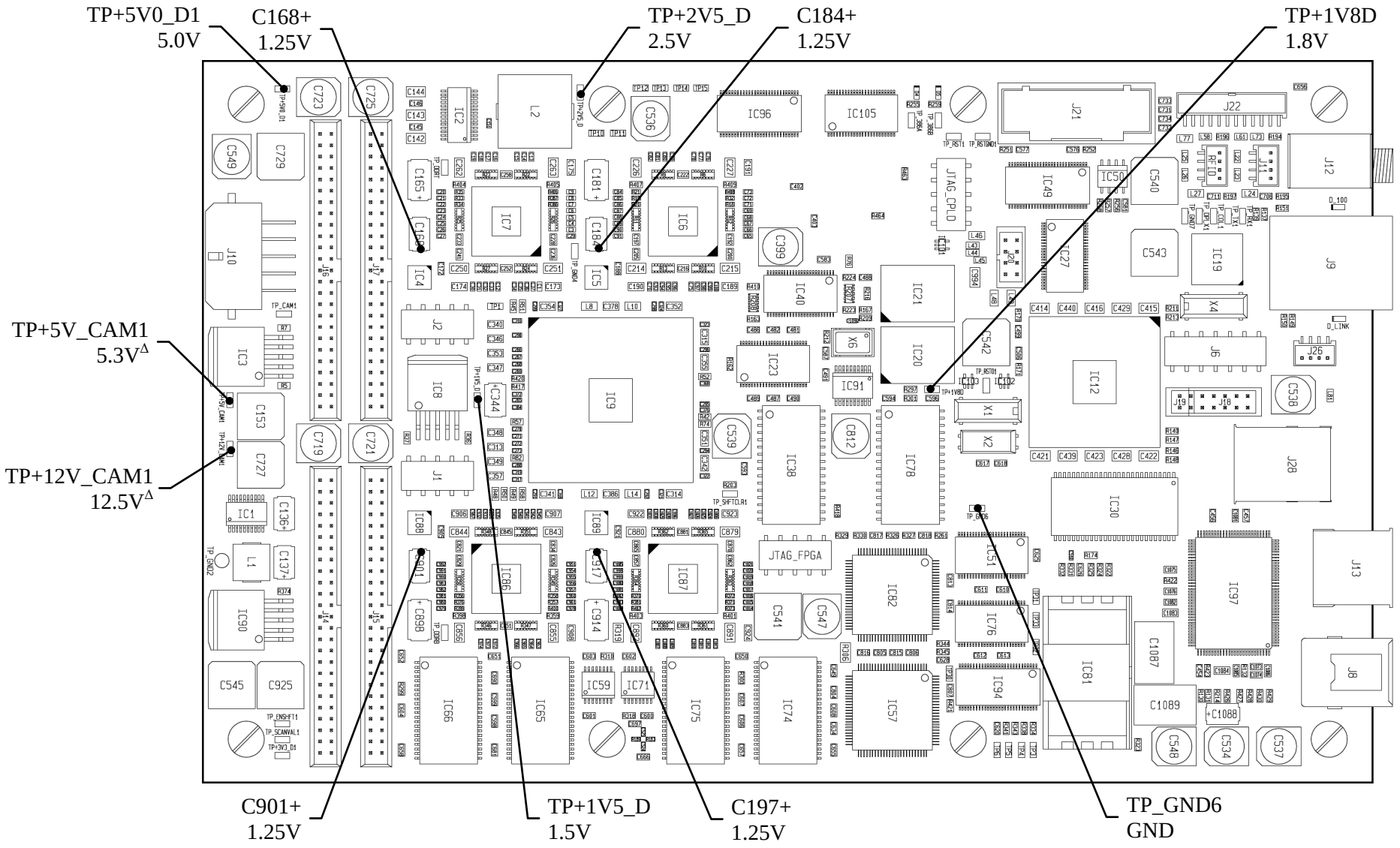
The three signal LEDs on the SUD board are for debugging purposes only. The ON/OFF pattern displayed by these LEDs is not intended for general troubleshooting.

3.8.6 Replacing the SUG Board

Important note on scanners with installed smart card:
When replacing the SUG board in a scanner *with a smart card installed*, the scanner serial number is read from the smart card. *You must confirm to use the read number within 30 seconds by pressing the "Enter" key on the operators panel, otherwise the scanner will display an error (100-50303, No serialnumber). In this case either reboot the scanner or use SCANtest to enter the serial number found on the marking label on back of the scanner.*

A spare SUG board may not contain the correct firmware. Install the correct firmware from the CD which comes with the board.

After replacement of the SUG Board run Scanner Maintenance.



∆ Supplied directly from the SMPS

Fig. 3-8, SUG Component Layout

3.9 SUH, Scanner Controller Board (KD67E, KE67E, KF67E, KH67E, KK67E, KN67E)

All test points referred to below are shown in Fig. 3-9, page 37.
All voltages are measured relative to test point GND2.

3.9.1 DC Voltages

Ref. on Fig. 3-7	DC Voltage	Remarks
12V_CAM	+12 V + 1/-0V	Supply for Camera Board, Elevation Motor (ATAC)
5V_CAM	+5.3 V +0/-0.2 V	Supply for Camera Board, MDA Board (ATAC)
+3.3V_D	+3.3 V ± 0.1 V	
+5V	+5.1 V +0.1/-0.2 V	Derived from 5.3V on SUF
APEX_SUP	+1.8 V ± 0.1 V	
APEX_PLL	+1.8 V ± 0.05 V	

3.9.2 Functional Test

SCANtest: Test 1 Scanner Information
Test 7, Complete Hardware Test

3.9.3 Markings

Note: SUH variant depends on scanner model.

KD67E	SUHBdd
KE67E	SUHBdd
KF67E	SUHAdd
KH67E	SUHCdd
KK67E	SUHDdd
KN67E	SUHAdd
where dd = board revision number.	

3.9.4 Signal LED's on the SUH Board

The three signal LEDs on the SUH board are for debugging purposes only. The ON/OFF pattern displayed by these LEDs is not intended for general troubleshooting.

3.9.5 Hints

After replacement of SUH board:
As all scanner parameters are stored in the Flash Memory on the SUH board, the following steps should be carried out after replacement of the SUH board:

- Download Firmware
- Run Scanner Maintenance
- Enter Serial Number of scanner into Flash Memory (SCANtest, Test 1). The serial number of the scanner is found on the marking label on back of the scanner

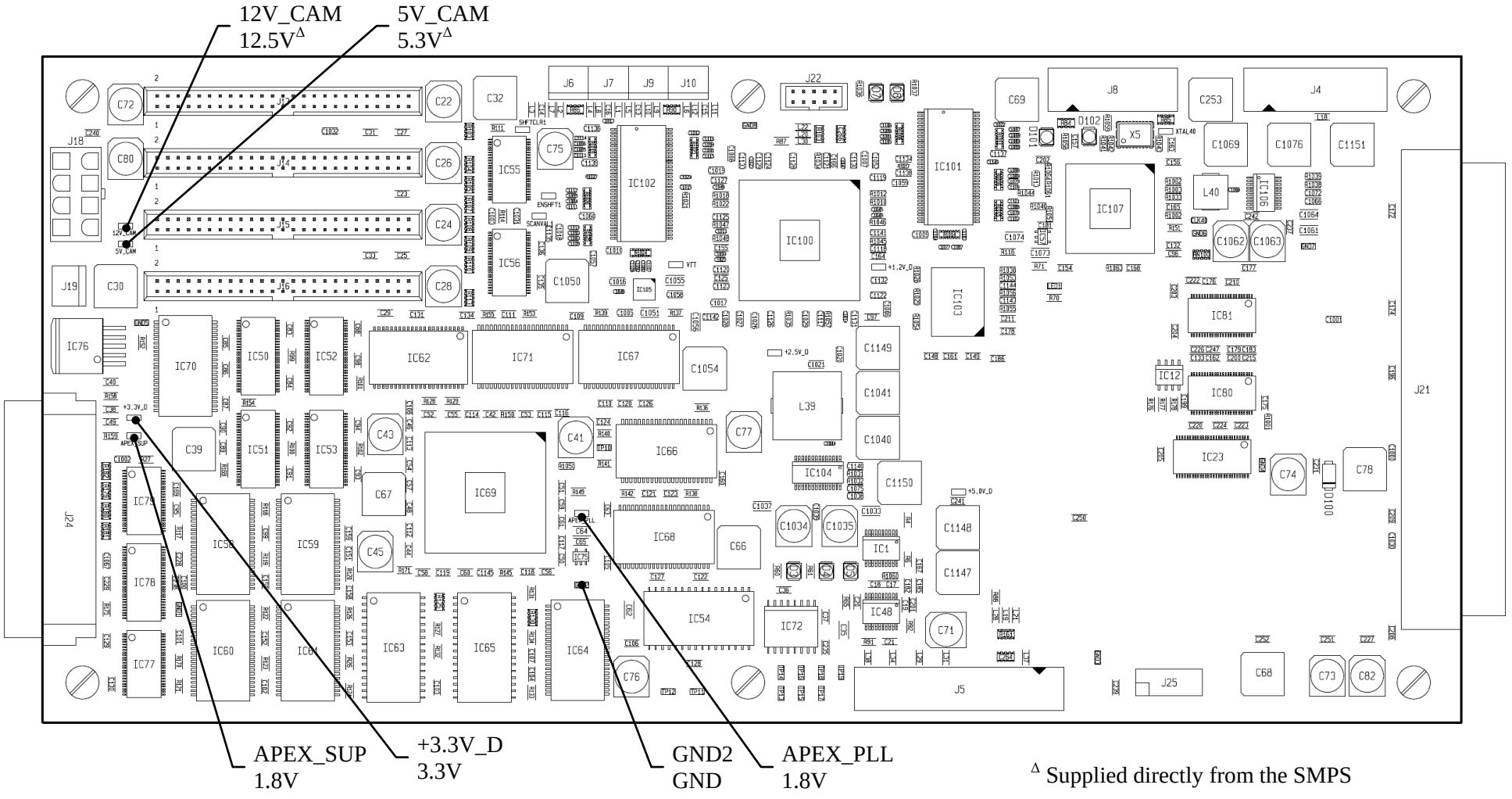


Fig. 3-9, SUH Component Layout

3.10 SKF, Operators Panel (KA67E, KC67E and KM67E only)

3.10.1 DC Voltages

All test points referred to are shown in Fig. 3-10 page 38
All voltages are measured relative to TP1 (GND)

Ref. on Fig. 3-10	DC Voltage	Remarks
TP6	+3.3V ± 0.1V	Generated from +5.3V
TP4	+5.0V ± 0.15V	Generated from +5.3V
C32+	+5.0V ± 0.15V	Generated from +5.3V
TP5	+5.3V	Supplied from SMPS via SUD

.

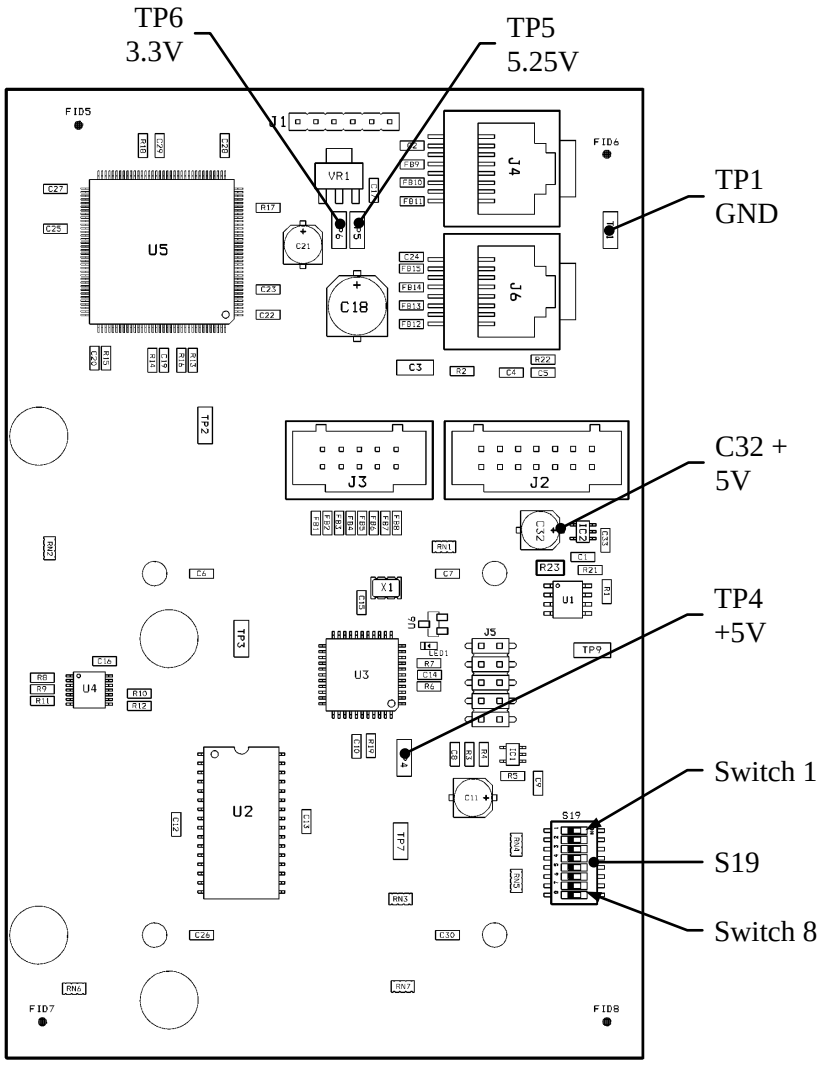


Fig. 3-10, SKF Component Layout

3.10.2 Functional Test

SCANtest: Test 1, Scanner ID Switch
Test 2, LED test
Test 3, Key test

3.10.3 Scanner ID Switch

SKF, DIP Switch settings (S19, see figure below):

Switch No:	1	2	3	4	5	6	7	8	HEX
KA67E	OFF	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	0x04
KC67E	OFF	OFF	OFF	OFF	**ON**	OFF	OFF	**ON**	0x09
KM67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	**ON**	**ON**	0x5B

An undefined switch setting may cause the 'Invalid Scanner ID' Error Code to be displayed on the Operator Panel.

NOTE: The Scanner ID Switch setting is stored in the Flash Memory on the SUx Board. Every time the scanner is switched ON, it reads the switch setting and if it is different from the stored value, the new setting will be stored and all other stored scanner parameters (including Basic Calibration and Color Calibration) will be cleared to default values.
This means that the scanner must be calibrated using Scanner Maintenance afterwards to restore the actual values.

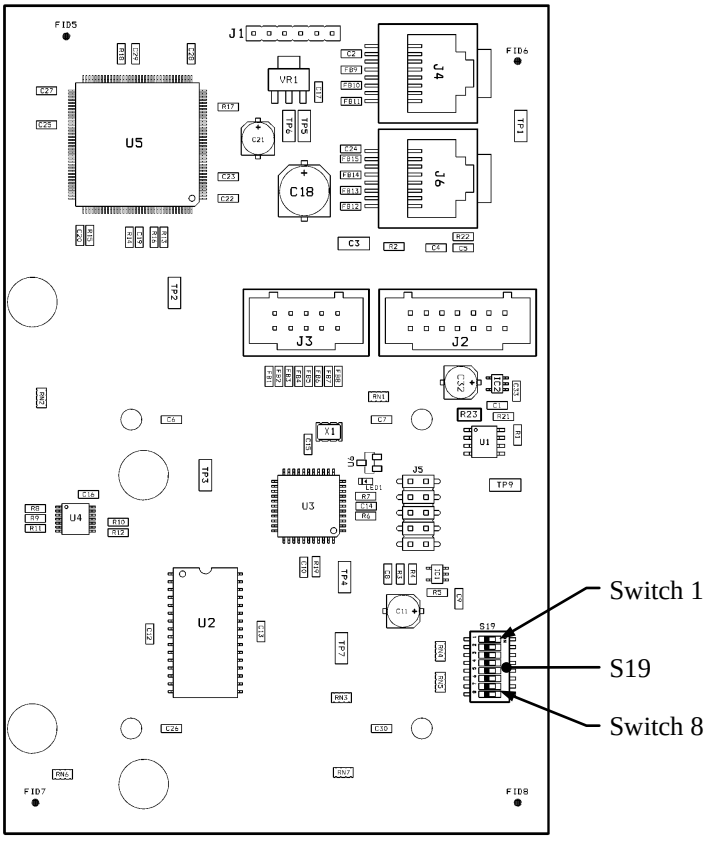


Fig. 3-11, Scanner ID Switch

3.10.4 Markings

KA67E	SKFAdd
KC67E	SKFAdd
KM67E	SKFAdd
where dd = board revision number.	

3.10.5 Operator Panel Layout

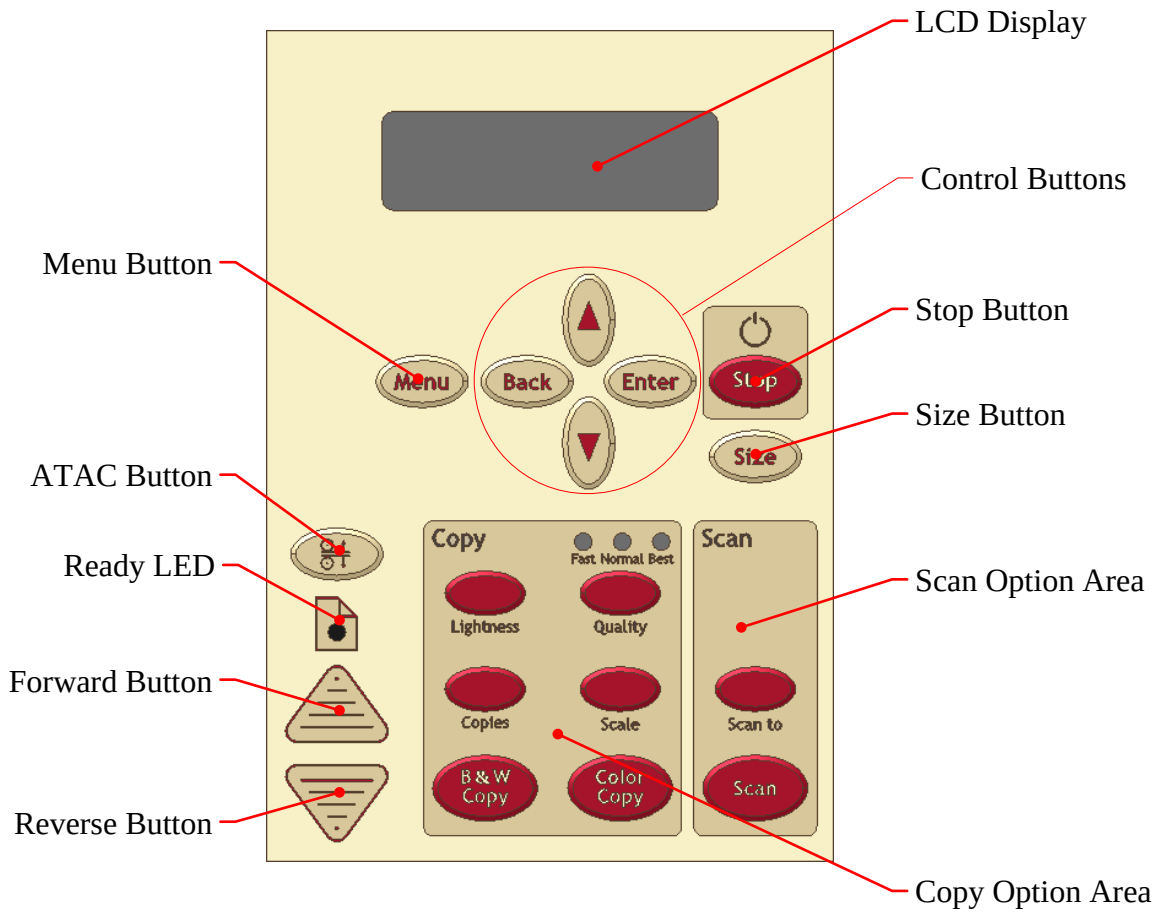


Fig. 3-12, Operator Panel Layout

- The LCD Display contains the current selections as you make them and useful messages from the scanner regarding maintenance and operation.
- Forward/Reverse Buttons can be used to feed paper. When the scanner is in Automatic Thickness Adjustment Control (ATAC) mode the paper forward and paper reverse keys become “Pressure-Platen Up” and “Pressure-Platen Down” buttons
- The Menu Button leads to a options for copy settings and an advanced submenu for configuration settings.
- The Control Buttons Arrow Up, Arrow Down, Back and Enter are for navigating the menus and for selecting menu options.
- The Stop Button is for interrupting a copy or scan process.
- The Size Button is for setting the original’s size (input size) for both copy and scan jobs.
- Below the control and menu buttons, are a Copy Option Area and a Scan Option Area, each with its own set of quick option buttons.

For a detailed description of the individual buttons and functions please refer to the scanners operators guide

3.11 SKD, Operators Panel (all except KA67E, KC67E and KM67E)

All test points referred to are shown in Fig. 3-13, page 42.
All voltages are measured relative to PCB Ground Plane.

3.11.1 DC Voltages

Ref. on Fig. 3-13	DC Voltage
J2,pin 3	+3.3 V ± 0.1 V
C1,top	+5.1 V +0.1/-0.2 V

3.11.2 Functional Test

SCANtest: Test 1, Scanner ID Switch
Test 2, LED test
Test 3, Key test

3.11.3 Markings

KD67E	SKDGdd
KE67E	SKDGdd
KF67E	SKDGdd
KH67E	SKDGdd
KK67E	SKDGdd
KL67E	SKD**A**dd
KN67E	SKDGdd
where dd = board revision number	

3.11.4 Switch Setting (Scanner ID)

DIP Switch Setting:

Scanner Model	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	HEX
KD67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	OFF	0x54
KE67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	OFF	**ON**	0x55
KF67E	OFF	**ON**	OFF	**ON**	OFF	**ON**	**ON**	OFF	0x56
KH67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	0x58
KK67E	OFF	**ON**	OFF	**ON**	**ON**	OFF	OFF	**ON**	0x59
KN67E	OFF	**ON**	OFF	**ON**	**ON**	**ON**	OFF	**ON**	0x5D

An undefined switch setting may cause the ‘Invalid Scanner ID’ Error Code to be displayed on the Operator Panel.

IMPORTANT: The Scanner ID Switch setting is stored in the Flash Memory on the SUx board. Every time the scanner is switched ON, it reads the switch setting and if it is different from the stored value, the new setting will be stored and all other stored scanner parameters (including Stitching, Basic Calibration and Color Calibration) will be cleared to default values. This means that the scanner must be calibrated using Scanner Maintenance afterwards to restore the actual values.

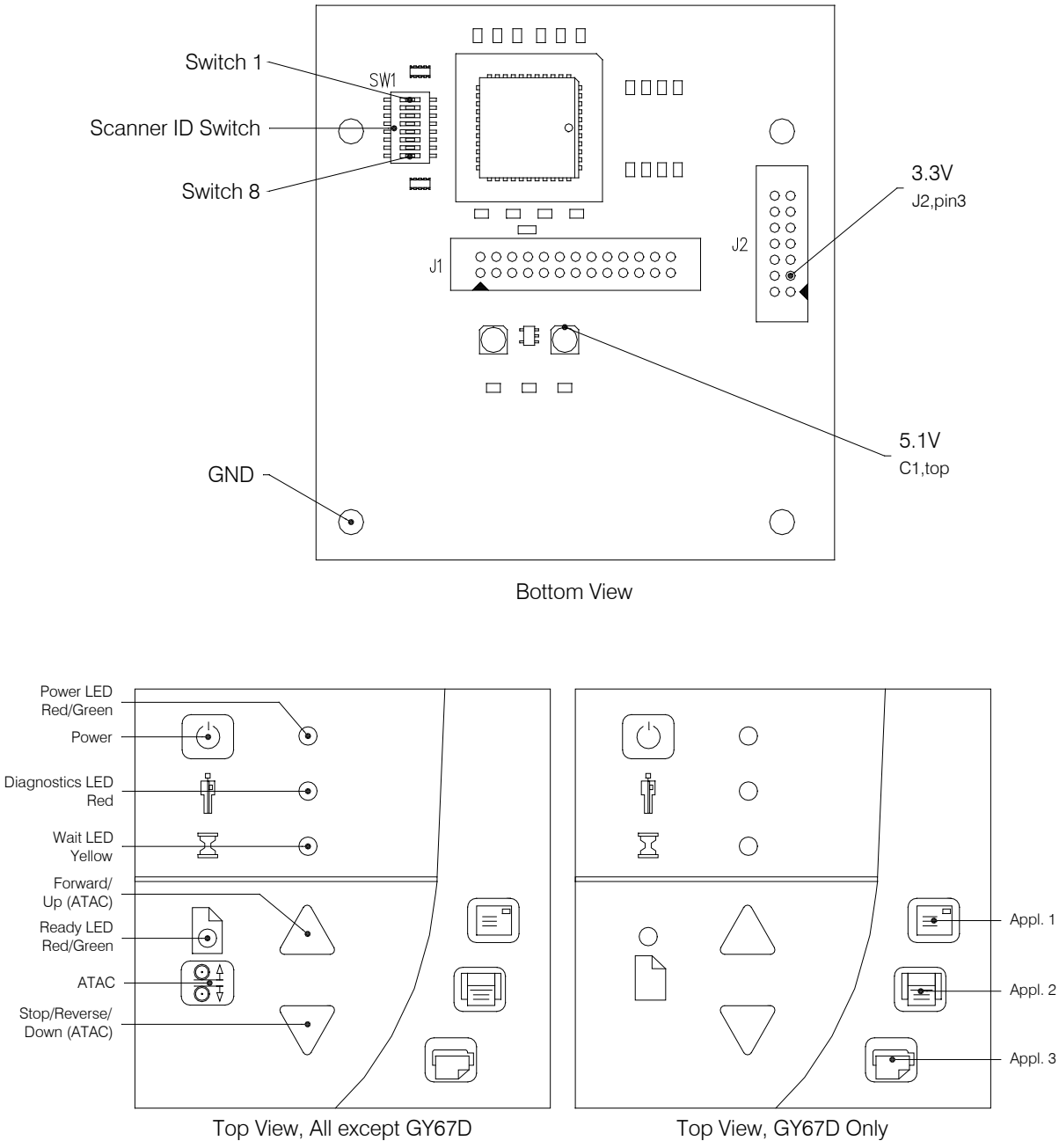


Fig. 3-13, SKD Component Layout

3.12 IMH, Interface Board (KL67E only)

All test points referred to below are shown in Fig. 3-14, page 43.
All voltages are measured relative to test points GND_T1.

3.12.1 DC Voltages

Ref. on Fig. 3-14	DC Voltage
R34, top	+5.3 V +0/-0.2 V
+5V0_D1	+5.2 V +0/-0.2 V
+3V3_D1	+3.3 V ± 0.1 V

3.12.2 Functional Test

Connect the computer to each separate port in turn and start SCANtest or WIDEsystem to check if the scanner is connecting on all available ports.

3.12.3 Markings

KL67E	IMHAdd
where dd = board revision number	

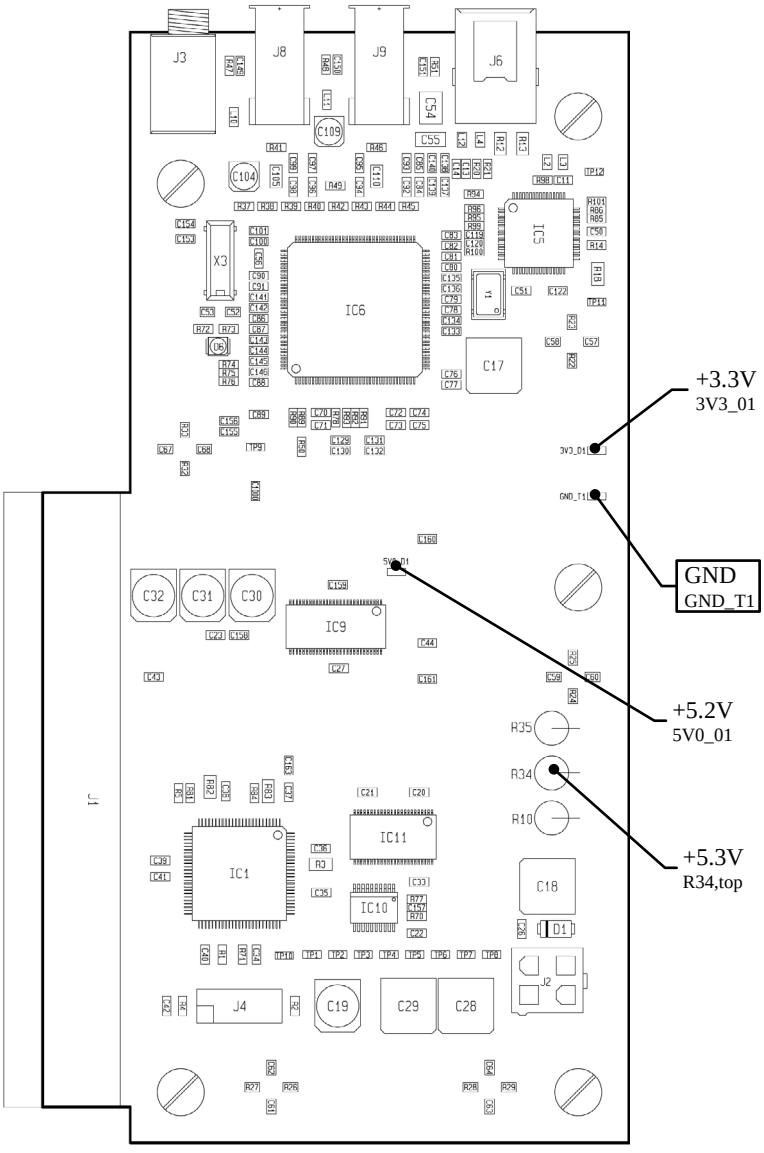


Fig. 3-14, IMH Component Layout

3.13 IMK, Interface Board (KD67E, KE67E, KF67E, KH67E, KK67E , KN67E only)

All test points referred to below are shown in Fig. 3-15, page 44.
All voltages are measured relative to test points GND_T1.

3.13.1 DC Voltages

Ref. on Fig. 3-15	DC Voltage
R34, top	+5.3 V +0/-0.2 V
+5V0_D1	+5.2 V +0/-0.2 V
+3V3_D1	+3.3 V ± 0.1 V

3.13.2 Functional Test

Connect the computer to each separate port in turn and start SCANtest or WIDEsystem to check if the scanner is connecting on all ports available.

3.13.3 Markings

KD67E	IMKCdd
KE67E	IMKCdd
KF67E	IMKCdd
KH67E	IMKCdd
KK67E	IMKCdd
KN67E	IMKCdd
where dd = board revision number	

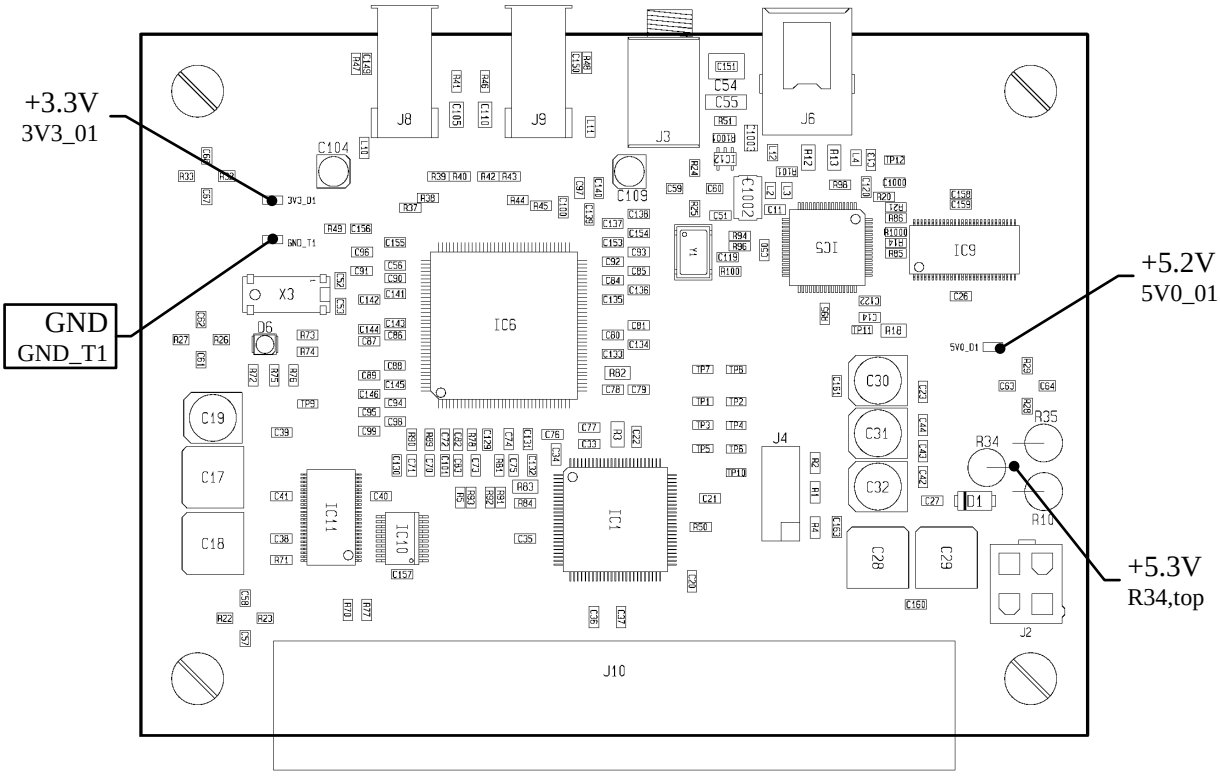


Fig. 3-15, IMK Component Layout

3.14 MDA, Motor Driver Board (All except KL67E)

All test points referred to below are shown in Fig. 3-16, page 45.
All voltages are measured relative to test points TP1 (GND).

3.14.1 DC Voltages

Ref. on Fig. 3-16	DC Voltage	Remarks
C2, left	+12.0 V +1/-0 V	SUx, 12V_CAM
C4, top	+5.3 V +0/-0.2 V	SUx, 5V_CAM
TP2	+5.0 V ± 0.15 V	Regulator on MDA
TP4	+3.3 V ± 0.1 V	Regulator on MDA

3.14.2 Functional Test

Test 28, Original Sensor Test

3.14.3 Markings

KA67E	MDACdd
KC67E	MDACdd
KD67E	MDACdd
KE67E	MDACdd
KF67E	MDACdd
KH67E	MDACdd
KK67E	MDACdd
KM67E	MDACdd
KN67E	MDACdd
where dd = board revision number.	

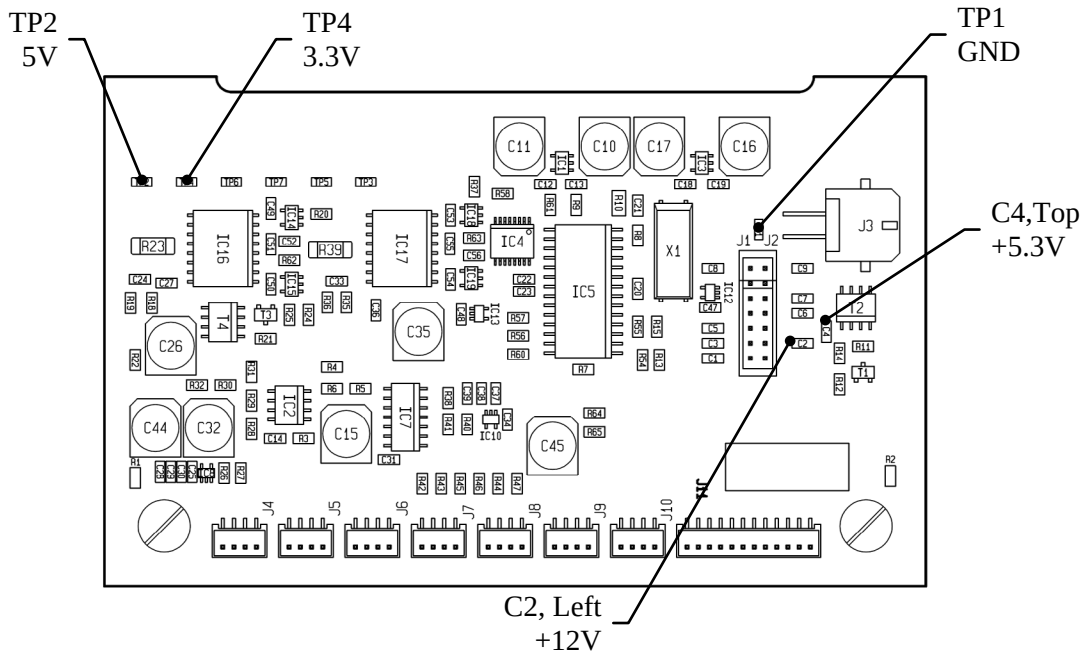


Fig. 3-16, MDA Component Layout

3.15 CRB, Card Reader Board (All except KL67E)

3.15.1 CRB Switch

Default Switch Setting:

Switch No:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
KA67E* **KC67E*** **KM67E***	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
* This switch is not used at the moment and is reserved for future use. However, it is important to set all switches to OFF								
KD67E **KE67E** **KF67E** **KH67E** **KK67E** **KN67E**	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF
Note that SCSI related switch settings (SW No. 1, 2, 3, 4, and 5) do not apply to these scanners								

3.15.2 Markings

KA67E	CRBCdd
KC67E	CRBCdd
KD67E	CRBCdd
KE67E	CRBCdd
KF67E	CRBCdd
KH67E	CRBCdd
KK67E	CRBCdd
KM67E	CRBCdd
KN67E	CRBCdd
where dd = board revision number.	

3.15.3 Signal LED on CRB Board

The signal LED (LED1) on the CRB Board turns ON when a Smart Card is inserted. It only signals, that a Smart Card has been inserted, it does not show whether the card is valid or not.

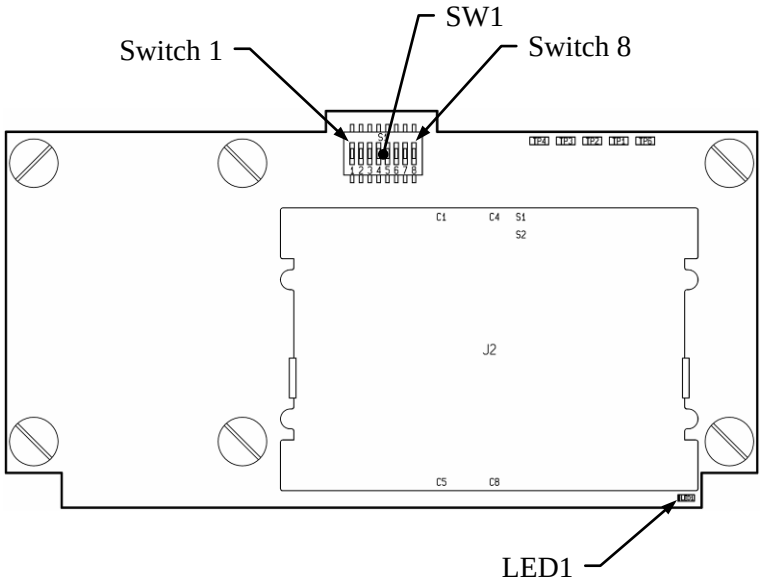


Fig. 3-17, CRB Component Layout

3.16 SCR, Smart Card Reader (KL67E only)

All test points referred to below are shown in Fig. 3-18, page 49.
All DC voltages are measured relative to test point GND (DIP Switch, right-side pins).

3.16.1 DC Voltages

Ref. on Fig. 3-18	DC Voltage
R2, top	+5.1 V +0.1/-0.2 V

3.16.2 DIP Switch Setting

SCSI related switch settings (SW No. 1, 2, 3, 4, and 5) do not apply to KL67E

Default DIP Switch Setting:

Switch No:	1	2	3	4	5	6	7	8
KL67E	**ON**	OFF	**ON**	**ON**	OFF	OFF	OFF	OFF

3.16.3 Signal LED on the SCR-Board

The signal LED on the SCR-Board turns ON when the Smart Card is inserted. It only signals, that a Smart Card has been inserted, it does not show whether the card is valid or not.

3.16.4 Functional Test

SCANtest: Test 1, Scanner Model (Smart Card)

3.16.5 Markings

KL67E	SCRAdd
where dd = board revision number	

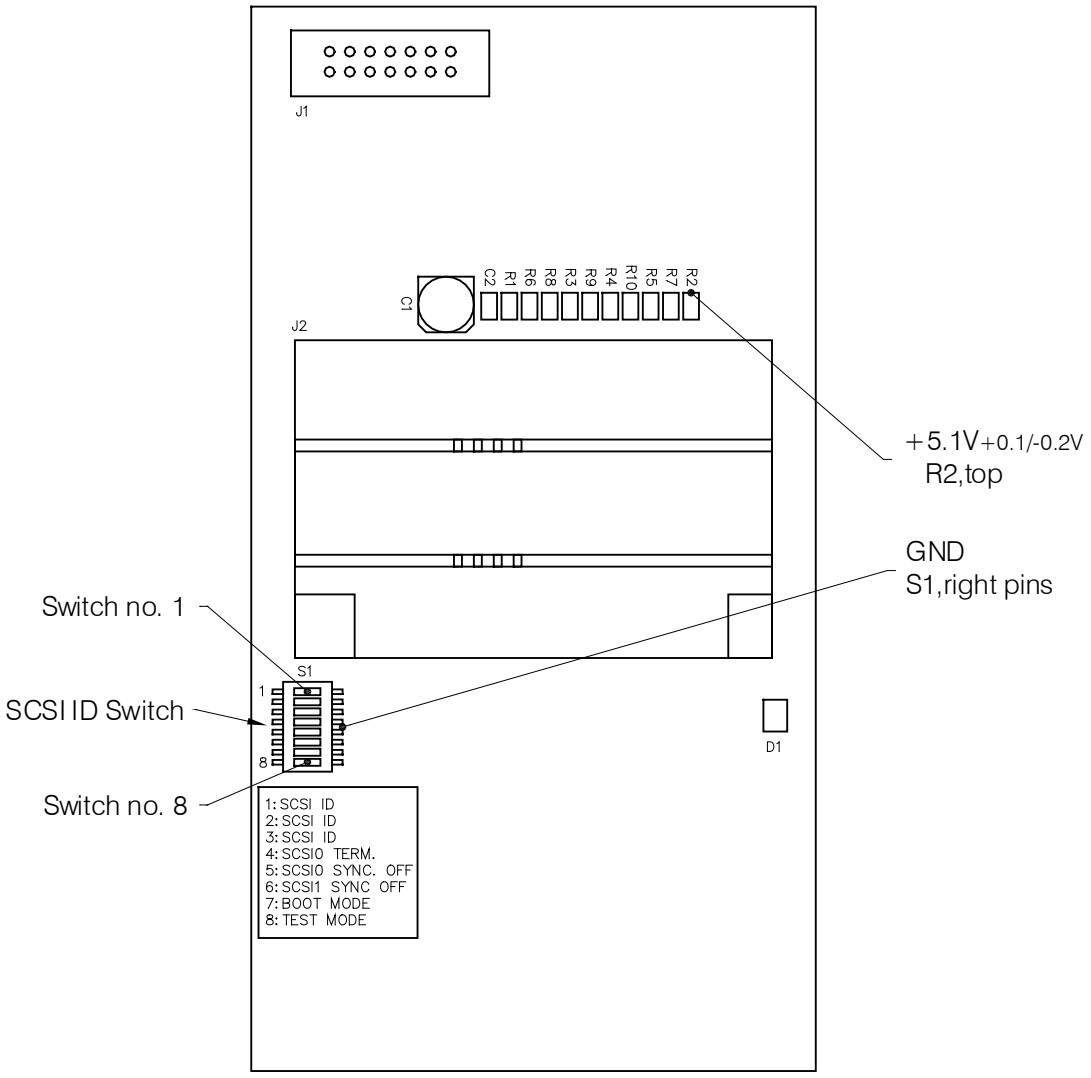


Fig. 3-18, SCR Component Layout

3.17 OSB, Lamp Sensor Board (KL67E only)

The OSB Component Layout is shown in Fig. 3-19, page 50.

3.17.1 Functional Test

SCANtest 6: Test 5, Lamp Test
Connect a voltmeter to TP11 on the LMF board
Switch the Lamp OFF / ON

The voltage on TP11 should change to approx. 5V when the lamp is switched OFF. When the lamp is ON the voltage should be in the range 1 to 4.8V depending on the age of the lamp.

3.17.2 Markings

KL67E	OSBCdd
where dd = board revision number	

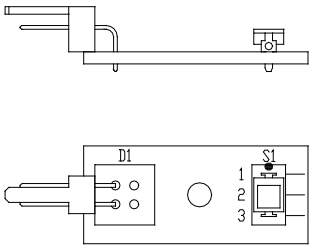


Fig. 3-19, OSB Component Layout

3.18 OIB, Optointerrupter Board (KL67E only)

The OIB Component Layout is shown in Fig. 3-20, page 50.

3.18.1 Functional Test

SCANtest: Test 4, Original-Sensor Test

3.18.2 Markings

KL67E	OIBAdd
where dd = board revision number	

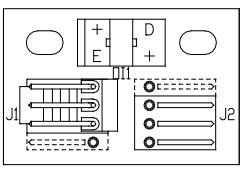


Fig. 3-20, OIBA Component Layout

3.19 SSU, Scanner Storage Unit (KC67E and KM67E only)

The Scanner Storage Unit is used as temporary storage when making multiple copies or when making WEB scans. When the scanner boots the temporary storage area is reformatted and all files deleted.
Settings made using the iJET Panel are saved on a different area of the Scanner Storage Unit. These settings are permanent.

3.19.1 Functional Test

The Scanner Storage Unit is tested as a part of the SUx board (Test 7, Complete Hardware Test)

3.19.2 Markings

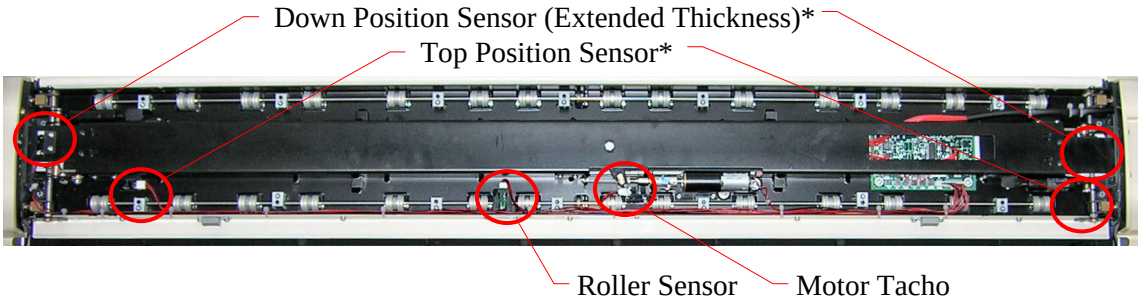
No marking

3.19.3 Replacing the Scanner Storage Unit

When replacing the Scanner Storage Unit configuration and setup made using the iJET Panel will be lost.

3.20 Check and Adjustment of Original Guide Sensors (ATAC)

The ATAC system has three sensors of which two can be adjusted plus a Tacho Sensor for the Elevation Motor.



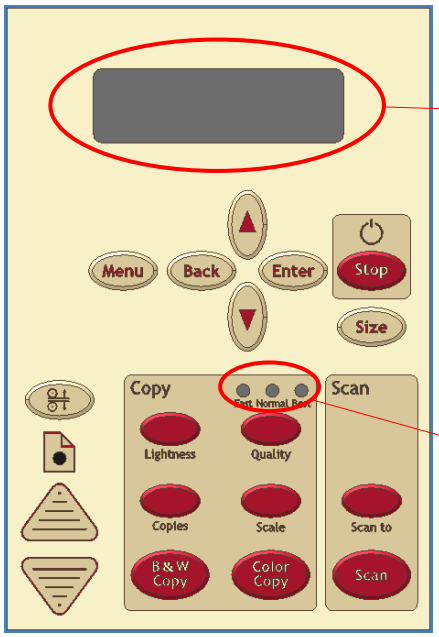
* Depending on ATAC type these sensors are either at the LHS (Type 1) or the RHS (Type 2)

Fig. 3-21, Original Guide Plate Sensors

Down Position Sensor		Detects when the Guide Plate is raised approx. 2mm Paper handling is switched to "Extended Thickness"
Top Position Sensor	*Adjustable*	Detects when the Top Position is reached and switches off the motor
Roller Sensor	*Adjustable*	Detects when the Guide Plate has reached the surface of the original and switches off the motor
Motor Tacho		Detects that the Elevation Motor is actually running

When Test 28 (SCANtest) is started, the status of three of the sensors is shown on the PC screen as well as on the keyboard LED display (KA67E, KC67E, KM67E only) and by the LED's on the keyboard:

Scanners with LED display:

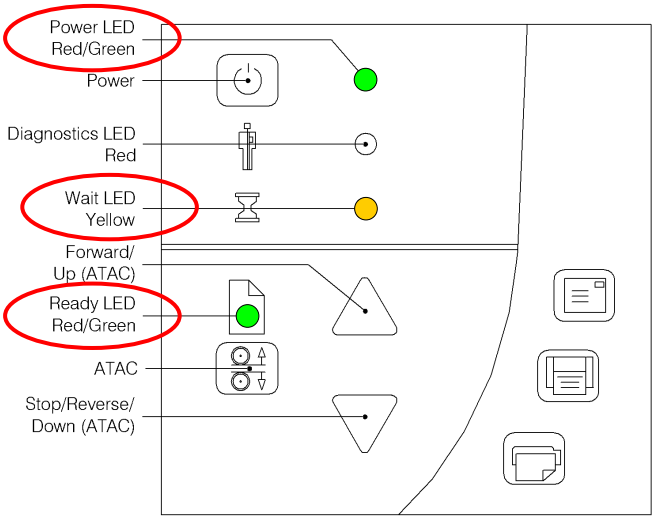


Test Mode
low:0 up:0 roll:0

and by the three green LED's on the keyboard:

	Down Position Sensor (Extended Thickness)	Top Position Sensor	Roller Sensor
LED	**Fast**	**Normal**	**Best**

Scanners without LED display:



	Down Position Sensor (Extended Thickness)	Top Position Sensor	Roller Sensor
LED	**Wait**	**Power**	**Ready**

The sensors are located under the Top Profile of the Original Guide. To get access to the sensors:

- Remove the Ruler from the Original Guide
- Remove the 4 fixing screws behind the Ruler
- Open the Top Profile (Lid)
- Release the lock screw in one of the bearings of the Top Profile
- Slide the bearing off and lift off the Top Profile

Note 1: All sensors are click-mounted on brackets. The position of the sensor brackets are secured by means of two fixing screws. To make the sensor adjustment easier, the left fixing screw goes through a round and the right through an oblong hole.
The bracket for the tacho sensor is secured by only one fixing screw

Note 2: For safety reasons, the current to the Elevation Motor is constantly monitored. If the currents exceeds a predetermined value, the drive circuit will be switched OFF and the motor stops and can no longer be controlled from the Operator Panel. ***To reset the OFF condition, the power must be removed from the MDA Board, either by disconnection of the power cable (connector J1 on MDA) or by switching the scanner OFF/ON.***

Note 3: When moving the Original Guide towards "top position", the motor should be manually stopped before the spindle-nut reaches the left end of the spindle. Allow for a clearance of about 1-2 mm as shown below. If the UP Key is pressed until the spindle-nut hits the end-stop of the spindle, the motor will be switched OFF by the current limit circuit and can no longer be controlled from the Operator Panel, see note 2 above.

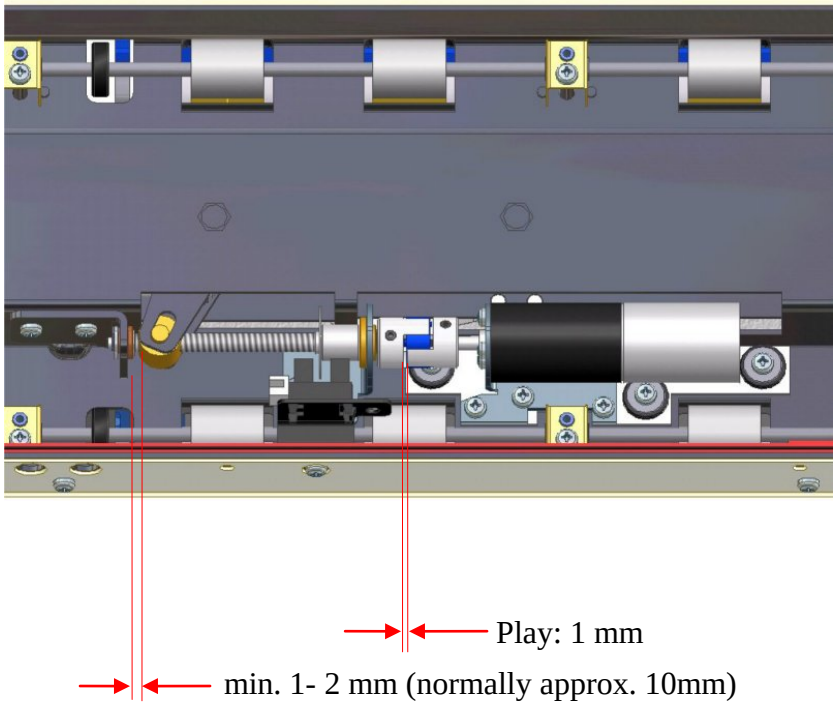


Fig. 3-22, Elevation Motor and Spindle

3.20.1 Adjustment of Roller Sensor

Start SCANtest

Select Test 28, Original Guide Sensor Test

Press UP Key to move Original Guide up at the least until the rollers of the Guide Plate slips the Feed Rollers (**Best**/**Ready** LED is turned OFF).

Insert the 1.5 mm end of the two Adjustment Tools under the roller shaft on both sides of the Roller Sensor, and adjust the position of the Roller Sensor ***just*** to turn the green **Best/Ready** LED ON.

Insert the 1 mm end of the two Adjustment Tools under the roller shaft on both sides of the Roller Sensor, and check that the green **Best/Ready** LED is OFF.

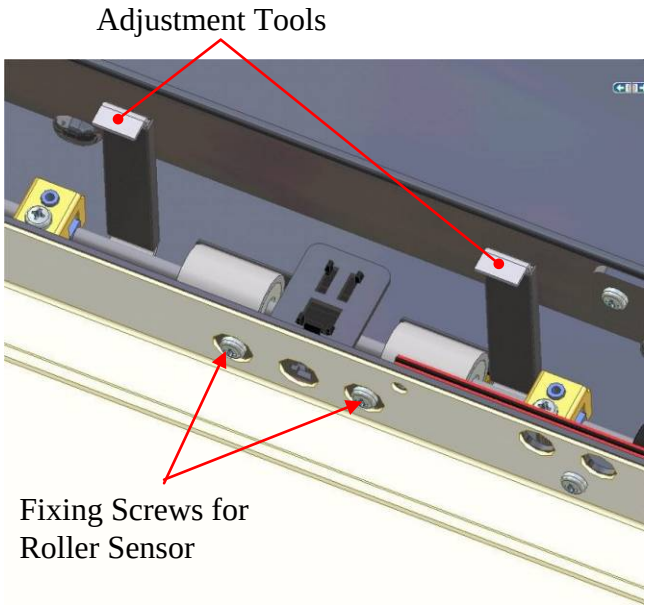


Fig. 3-23, Adjustment of Roller Sensor

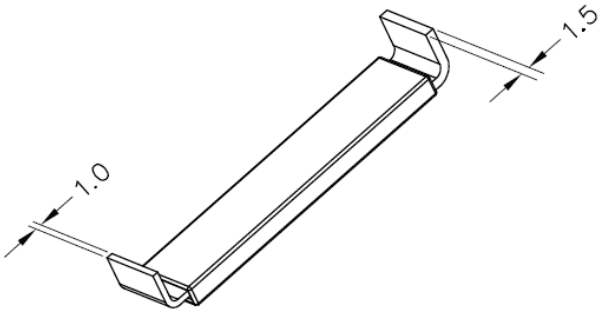


Fig. 3-24, Adjustment Tool for Roller Sensor

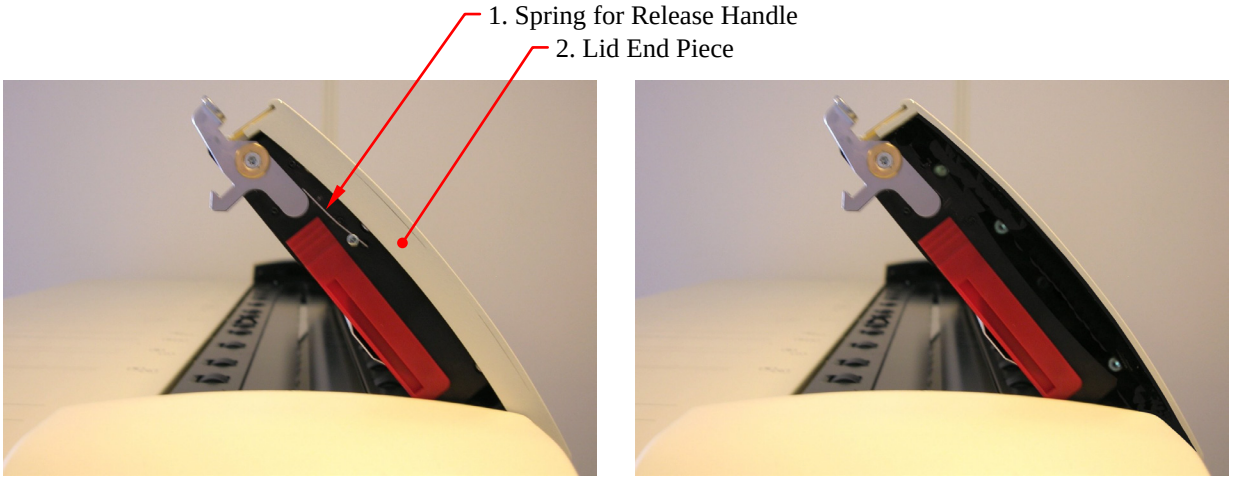
3.20.2 Top Position Sensor

The Original Guide Plate exists in two types/constructions, Type 1 to Type 2:

OGP Type	Scanner Model
Type 1	KA67E KC67E KD67E KM67E KN67E
Type 2	KE67E KF67E KH67E KK67E

When opening the Guide Plate the two versions can be distinguished by the following two characteristics, see images below:

1. On Type 1 the spring for the Release Handle is omitted
2. The Lid End Pieces has been moved to the Guide Plate



Type 1 Type 2

Fig. 3-25, Type 1 and Type 2 Original Guide Plate with ATAC

3.20.3 Adjustment of Top Position Sensor, Type 1 (KA67E,KC67E,KD67E,KM67E,KN67E)

Make sure the Original Guide is closed and properly locked

Start SCANtest
Select Test 28, Original Guide Sensor Test

Loosen the fixing screws of the Top Position Sensor bracket
Move the sensor to its uppermost position and fasten the fixing screws

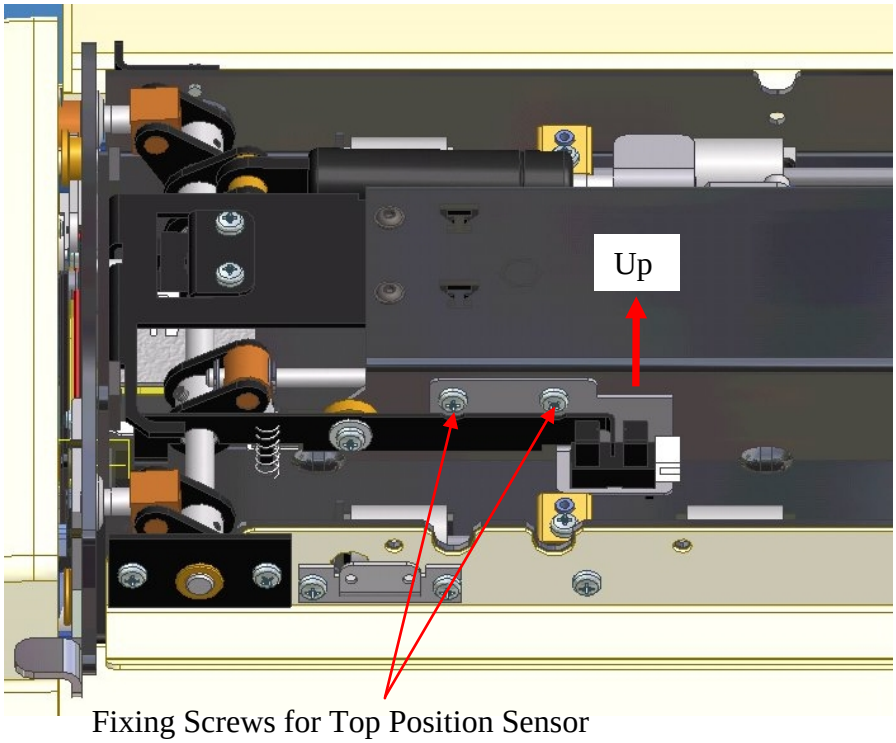


Fig. 3-26, Adjustment of Top Position Sensor (Type 1)

Press the UP Key to move Original Guide to Top Position. *Make sure to stop the motor before the spindle-nut reach the left end of the spindle (see note 3 above).*

Open the Original Guide

Orientate the two adjustment guides (see Fig. 3-28 page 59) for 16 mm spacing and place the guides under the Original Guide at either end of the scan area.
The surface marked "16" must be facing the White Background Plate.
The cut out must be centred over the light aperture of the glass plate not to damage the White Background Plate when the Original Guide is moved down against the adjustment guide.

Close the Original Guide and make sure that both Release Handles lock

Press the Down Key to move the Original Guide down until it automatically stops against the adjustment guides.
If the Down Key is pressed after the Original Guide has stopped, the MDA Board ends up in the OFF condition described in note 2 above.

Adjust the position of the Top Position sensor ***just*** to turn the **Normal/Power** LED ON

Open the Original Guide

Orientate the two adjustment guides for 15.5 mm spacing and place the guides under the Original Guide at either end of the scan area.
The surface marked "15.5" must be facing the White Background Plate.
The cut out must be centred over the light aperture of the glass plate not to damage the White Background Plate when the Original Guide is moved down against the adjustment guide.

Close the Original Guide and make sure that both Release Handles lock.

Press the Down Key to move the Original Guide down until it automatically stops against the adjustment guides.

The **Normal/Power** LED should now have switched OFF. If not repeat this adjustment and be careful not to "over adjust" the Top Position sensor.

3.20.4 Adjustment of Top Position Sensor, Type 2 (KE67E, KF67E, KH67E, KK67E)

Make sure the Original Guide is closed and properly locked

Start SCANtest
Select Test 28, Original Guide Sensor Test

Loosen the fixing screws of the Top Position Sensor bracket
Move the sensor to its uppermost position and fasten the fixing screws

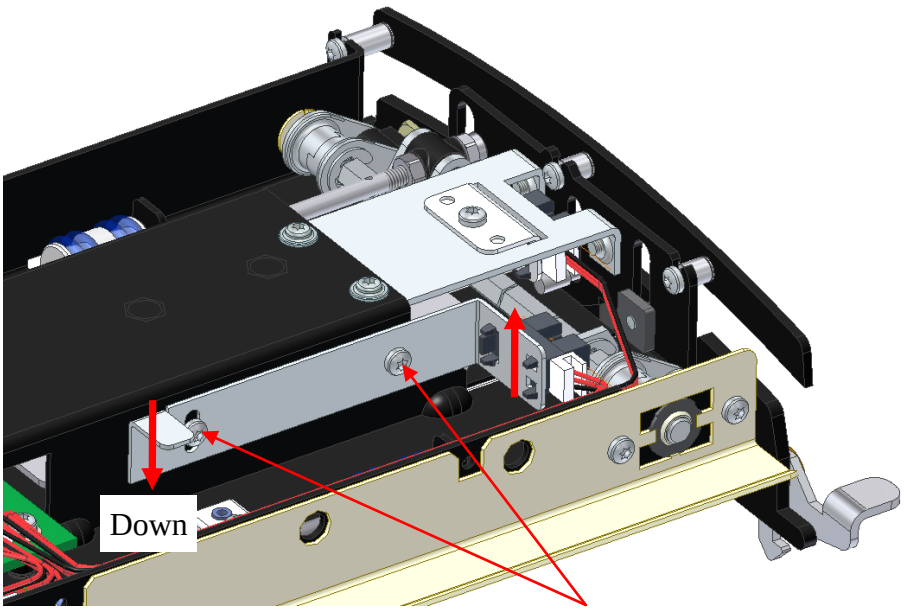


Fig. 3-27, Adjustment of Top Position Sensor (Type 2)

Press the UP Key to move Original Guide to Top Position. *Make sure to stop the motor before the spindle-nut reach the left end of the spindle (see note 3 above).*

Open the Original Guide

Orientate the two adjustment guides (see Fig. 3-28 page 59) for 16 mm spacing and place the guides under the Original Guide at either end of the scan area.
The surface marked "16" must be facing the White Background Plate.
The cut out must be centred over the light aperture of the glass plate not to damage the White Background Plate when the Original Guide is moved down against the adjustment guide.

Close the Original Guide and make sure that both Release Handles lock

Press the Down Key to move the Original Guide down until it automatically stops against the adjustment guides.
If the Down Key is pressed after the Original Guide has stopped, the MDA Board ends up in the OFF condition described in note 2 above.

Adjust the position of the Top Position sensor ***just*** to turn the **Power** LED ON

Open the Original Guide

Orientate the two adjustment guides for 15.5 mm spacing and place the guides under the Original Guide at either end of the scan area.
The surface marked "15.5" must be facing the White Background Plate.
The cut out must be centred over the light aperture of the glass plate not to damage the White Background Plate when the Original Guide is moved down against the adjustment guide.

Close the Original Guide and make sure that both Release Handles lock.

Press the Down Key to move the Original Guide down until it automatically stops against the adjustment guides.

The **Power** LED should now have switched OFF. If not repeat this adjustment and be careful not to "over adjust" the Top Position sensor.

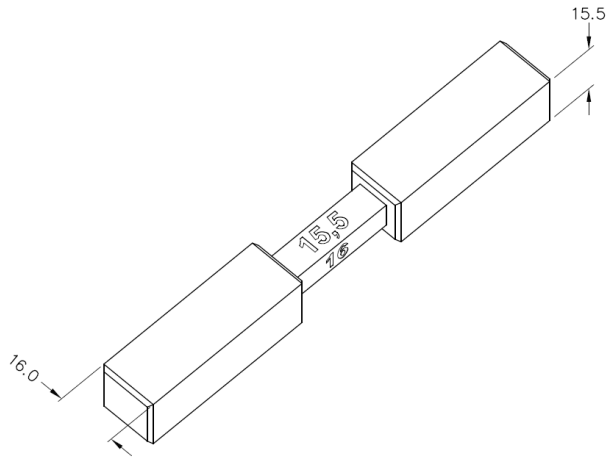


Fig. 3-28, Adjustment Tool for Top Position Sensor

3.20.5 Check of ATAC Position Sensors

Start SCANtest

Select Test 28, Original Guide Sensor Test

Press the UP Key to move Original Guide to Top Position

Move the Original Guide down by pressing the Down Key and observe that the LED's go OFF/ON in following sequence as shown in the table below:

Position	Fast/ Wait	Normal/ Power	Best/ Ready	Comment
Fully up	OFF	**ON**	OFF	
Moved "a little" down	OFF	**OFF**	OFF	Top Position Sensor
Almost fully down	**ON**	OFF	OFF	Down Position Sensor *
Fully down	ON	OFF	**ON**	Roller Sensor

*) The Down Position Sensor cannot be adjusted

3.21 Adjustment of Original Sensors (all except KL67E)

The Original Sensor comes complete with Mounting Bracket. Please replace the whole unit. No adjustment is needed.

3.22 Adjustment of Original Sensors (KL67E only)

The Original Sensors are located under the End Cover at the Operator Panel end of the scanner.

3.22.1 Adjustment of Switch Point

See Fig. 3-29, page 62.

To adjust the Original Sensors:

- Remove the Guard Plate over the Optical Interrupter Board
- Loosen the screws that hold the bracket with the Optical Interrupter Board

Adjust the switch point by shifting the OIB-Board up/down until the peak of the curved Original Sensor Actuator is:

3.9 mm +/- 0.5 mm above the top of the Feed Rollers

Note that the Shutter must rest on top of the one leg of the Optical Interrupter.

All Original Sensor Actuators must be within the above tolerance.

Check:

- That the Original Sensor Shutter moves freely in the gap of the opto-interrupter, when the Sensor Actuator is activated.
- That the Entry Original Sensor Shutter does not touch the press nut for the Glass Plate bearing, when the Sensor Actuator is activated.
- That the Torsion Springs are correctly mounted.

3.22.2 Functional Test

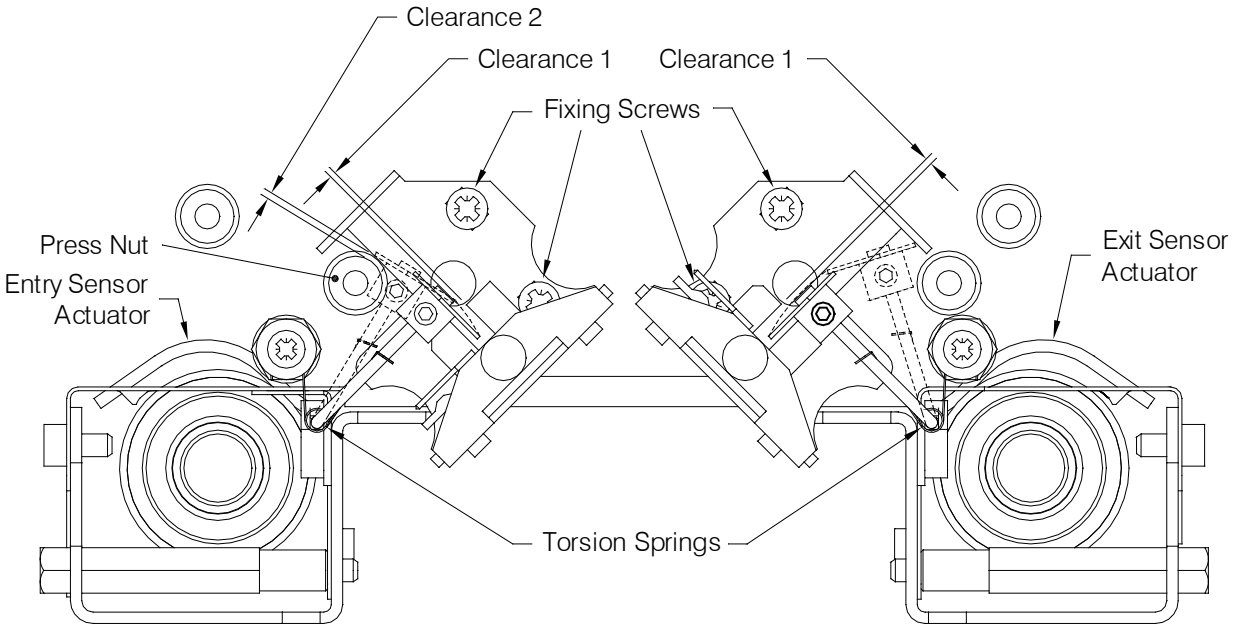
SCANtest: Test 4, Original Sensor Test

3.22.3 Hints

The Exit Sensor determines the Start of Scan position of the original. The original is first moved forward to activate the Exit Sensor and after that moved a pre-defined distance backwards to the Start of Scan position.

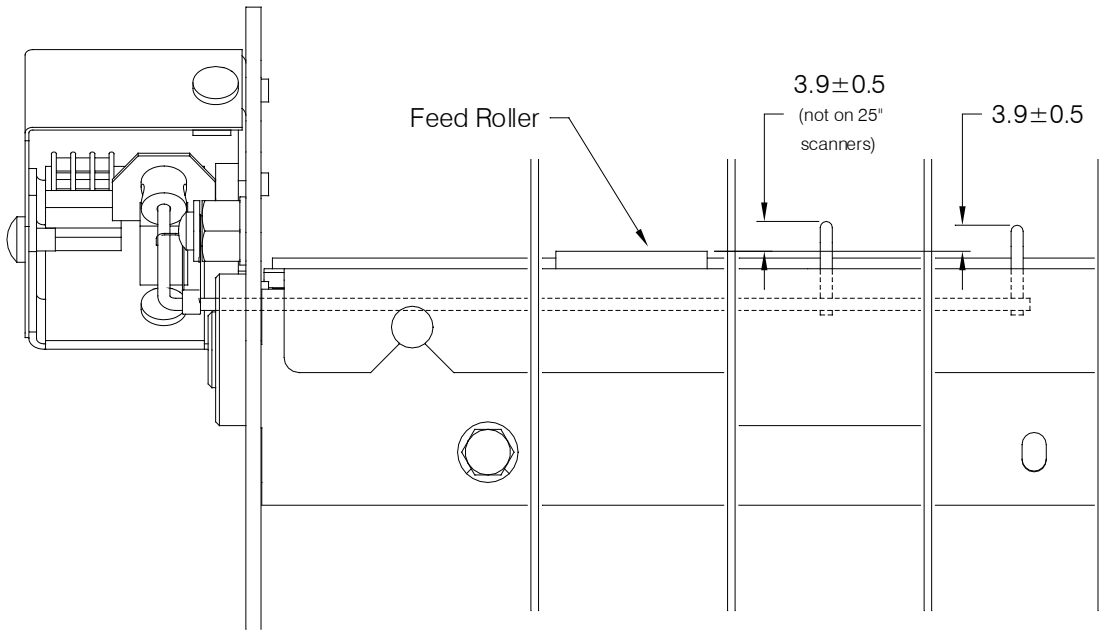
End of Scan is determined by a pre-defined distance form the position where the original releases the Entry Sensor.

The points of Start of Scan and End of Scan may be offset from WIDEimage (Scanner Setup / Media Offset).



Clerance 1: Make sure that the shutter plates do not touch the legs of the optointerrupter when moving (clearance >0.5 mm)

Clerance 2: Make sure that the shutter plates do not touch the press-nut when moving (clearance > 0.5mm)



Rear View

Fig. 3-29, Adjustment of Original-Sensors

3.23 LCA, Lamp Cartridge (all except KL67E)

The Lamp Cartridge consists of a lamp and a light sensor.
Each Lamp Cartridge is factory calibrated which means that the Lamp Cartridge can be replaced without the need for adjustment.

IMPORTANT: Do not try to disassemble the Lamp Cartridge in order to replace the lamp. This will ruin the calibration resulting in either reduced scanning quality or reduced lamp life.

Attempting to replace the lamp tube will violate safety and constitute a risk of electric shock, or injury to person

4. Camera Adjustment

For a detailed description of basic camera adjustment procedures please refer to FSG/TSM/001.
An alternative camera adjustment can be done using the SCA (Simple Camera Adjustment) tool, see Appendix 1, Camera Adjustment using the SCA Tool.

4.1 Camera Board Tilt

On some models it has been necessary to introduce a factory adjustment of the camera board tilt (CCD) relative to the focal plane of the lens. The tilt system consist of an adjustable spacer at the end opposite to the camera motor (Fig. 4-1) and a lock nut at the motor end (Fig. 4-2).

- *Do not change the position of the Lock Nut or the length of the Spacer*
- *Do not interchange Spacer between cameras.*

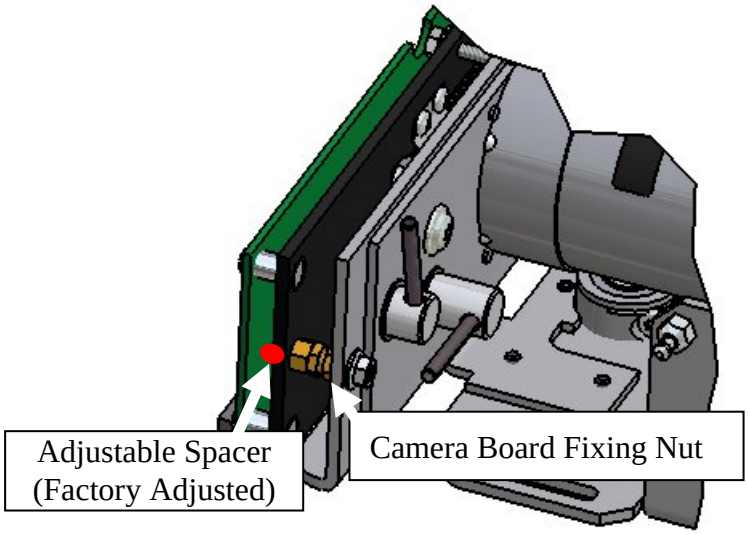


Fig. 4-1, Adjustable Spacer for Camera Board Tilt

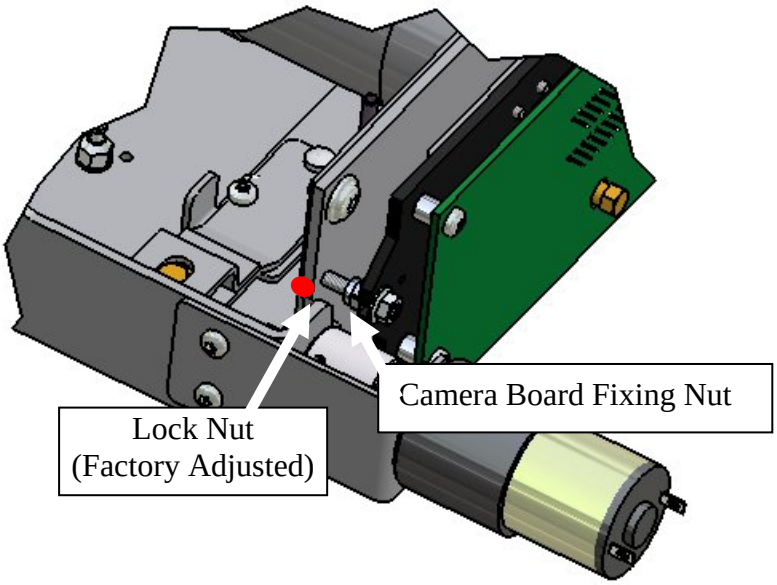


Fig. 4-2, Lock Nut for Camera Board Tilt

4.2 Setting Initial Position of the Vertical Alignment Arm (all except KL67E)

If the Vertical Alignment Arm has moved almost to one of the outer positions, it needs to be returned to its initial position. A reason for this could be that the arm is not fixed properly to the Vertical Adjustment Screw or because the vertical position of the fixed camera has changed significantly. The vertical position of the cameras should therefore be checked/adjusted at the same time.

Refer to Fig. 4-3 page 65.

- Loosen the lock screw for the Vertical Alignment Arm (located under the camera housing opposite to the Vertical Alignment Arm)
- Loosen (and just loosen) the assembly screw for the Vertical Alignment Arm
- Push the lower half of the arm forward (1) until the assembly screw is free of the upper half of the arm and then swing the upper half upwards (2)
- Detach the upper half of the arm from the Spindle Nut (3) and let the lower part swing backwards
- Rotate the Spindle Nut to position it in the center of the motor spindle
- Attach the upper half of the Vertical Alignment Arm using the reverse order of the above description
- Tighten the assembly screw for the Vertical Alignment Arm
- Tighten the lock screw for the Vertical Alignment Arm

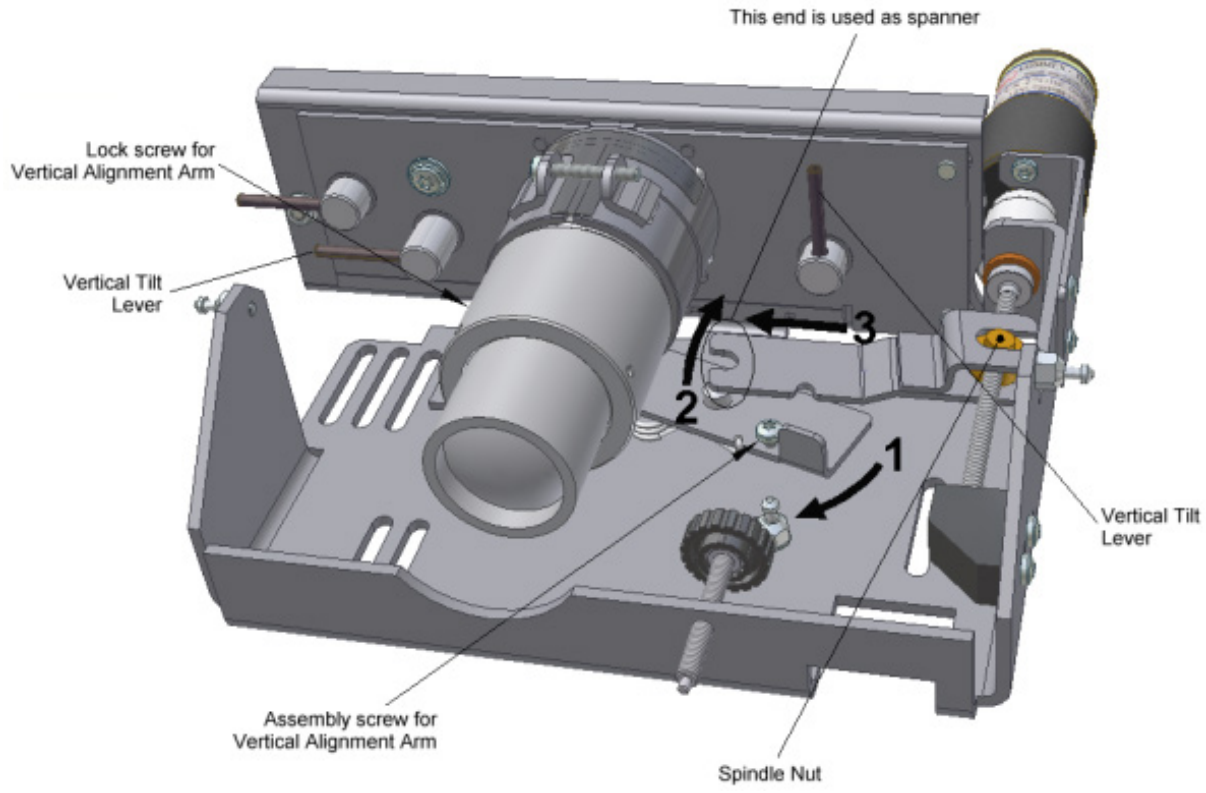


Fig. 4-3, CCD Camera (all except KL67E)

4.3 Adjusting the Camera Tilt

If the correct vertical position during camera adjustment can not be obtained by means of the tilt levers (see section 4.4.11) the camera tilt must be changed as described below.
Important: On cameras with motor set the Vertical Alignment Arm to its initial position before adjusting the camera tilt as described above.

4.3.1 Camera Tilt, All Models Except KL67E

The vertical position is adjusted by turning the Vertical Adjustment Screw (located under the camera housing) which tilts the camera. The screw must be turned using a special spanner and as it can be seen in Fig. 4-3 page 65 the spanner is the one end of the upper half of the Vertical Alignment Arm. However, even when the Vertical Alignment Arm is not fixed to the Vertical Adjustment Screw the camera tilt will change slightly when turning the Vertical Alignment Arm. Because of this the Vertical Alignment Arm has to be installed and set to its initial position when adjusting the vertical position of the camera. As this rules out using the upper half of the Vertical Alignment Arm of the camera which is adjusted, this part is attached to the spindle console of the fixed camera (camera B). The sole purpose of this part is to be used when adjusting the camera tilt.

- On cameras with motor: Loosen the lock screw for the Vertical Alignment Arm (located under the camera housing opposite to the Vertical Alignment Arm)
- On the fixed camera (camera B) locate the “upper half of the Vertical Alignment Arm” which is attached to the spindle console.
- Loosen the fixing screw and remove the arm. The end opposite to the spindle end is now used as a spanner for adjusting the Vertical Position, see Fig. 4-3 page 65.
- Set the Vertical Tilt Levers to their nominal positions, that is, horizontal position for the lever near the “connector end” of the camera board and vertical position for the other.
- Turn the Vertical Adjustment Screw using the “spanner” to get as total sum of 16 Black Lines (f.ex. 5 Black Lines at the start and 11 Black Lines at the end of the scanline).
- On cameras with motor: Tighten the lock screw for the Vertical Alignment Arm and proceed with the camera adjustment as described later in this chapter.

After replacement of the Camera Board (CBx) do:
- CCD-Centering
- Vertical Positioning
- Check Scan-Width. If it is within the limits given in 4.4.9, Focus will also be OK, and no further adjustments are required.
- Run Scanner Maintenance

These adjustments can be made without loosening the Camera Fixing Screws and without loosening the Focus Lock Ring / Lock Screw.

4.3.2 Camera Tilt (KL67E only)

The vertical position is adjusted by turning the Vertical Positioning Wheel (located under the camera housing) which tilts the camera.

- Set the Vertical Tilt Levers to their nominal positions, that is, horizontal position for the lever near the “connector end” of the camera board and vertical position for the other.
- Turn the Vertical Positioning Wheel to get as total sum of 16 Black Lines (f.ex. 5 Black Lines at the start and 11 Black Lines at the end of the scanline).
- Proceed with the camera adjustment as described later in this chapter

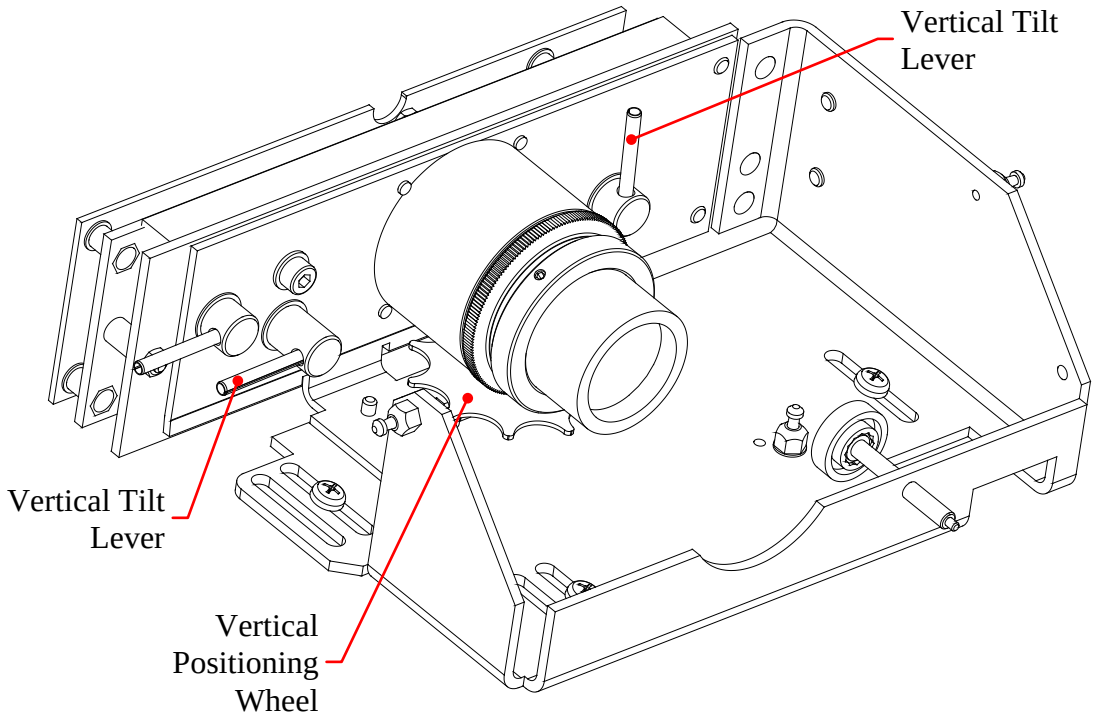


Fig. 4-4, CCD Camera (KL67E only)

After replacement of the Camera Board (CBx) do:

- CCD-Centering
- Vertical Positioning
- Check Scan-Width. If it is within the limits given in 4.4.9, Focus will also be OK, and no further adjustments are required.
- Run Scanner Maintenance

These adjustments can be made without loosening the Camera Fixing Screws and without loosening the Focus Lock Ring / Lock Screw.

4.4 CCD-Camera Check and Adjustment

To get access to the CCD Cameras the Top Cover must be removed. For a detailed description of basic camera adjustment procedures please refer to FSG/TSM/001.
Equipment needed:

- PC with SCANtest and Scanner Maintenance installed
- Service tools as listed in the table below:

	Type	**Optical Adjustment Pattern**	**Focus Pattern**	**Calibration Sheet**
KA67E KH67E KK67E	3C36	6779D138R01	6779D216R01	6799D171
KC67E KE67E KF67E KM67E	4C42	6779D144R01	6779D216R01	6799D171
KD67E KN67E	4C54	6779D130R01	6779D228R01	6799D165
KL67E	1C25	6779D105R01	6779D215R01	6799D115

4.4.1 Check of Light Profiles, 3C36" (KA67E, KH67E, KK67E)

The uncorrected and corrected light profiles are shown for reference below.

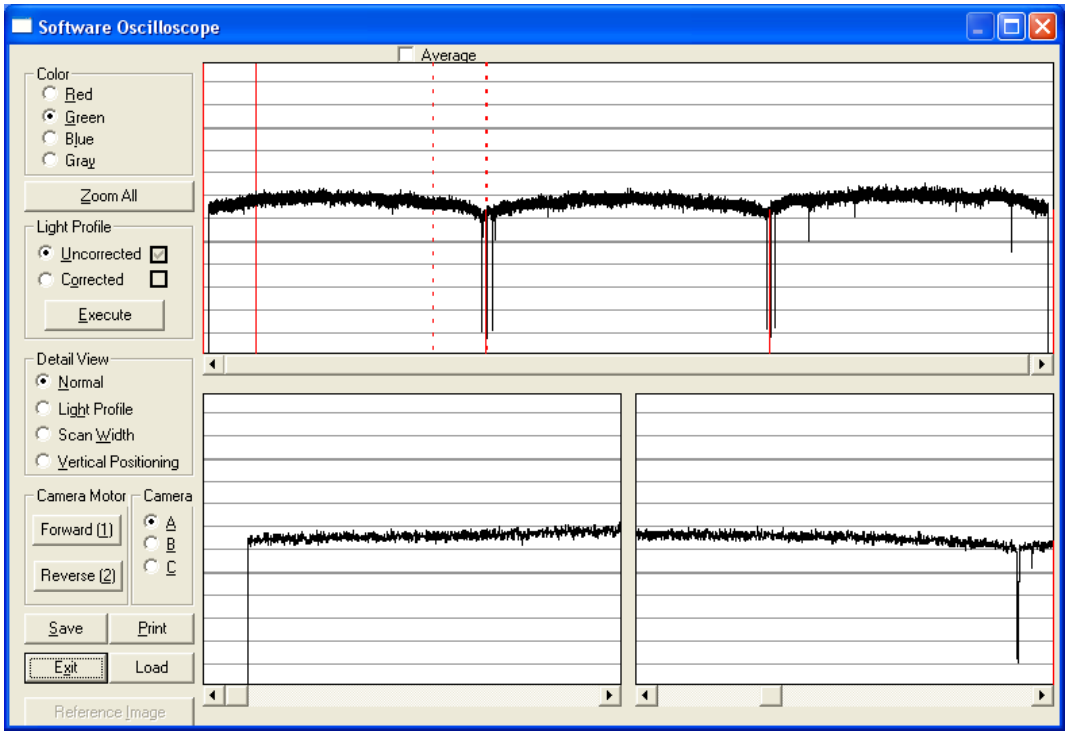


Fig. 4-5, Uncorrected Light Profiles, KA67E, KH67E, KK67E

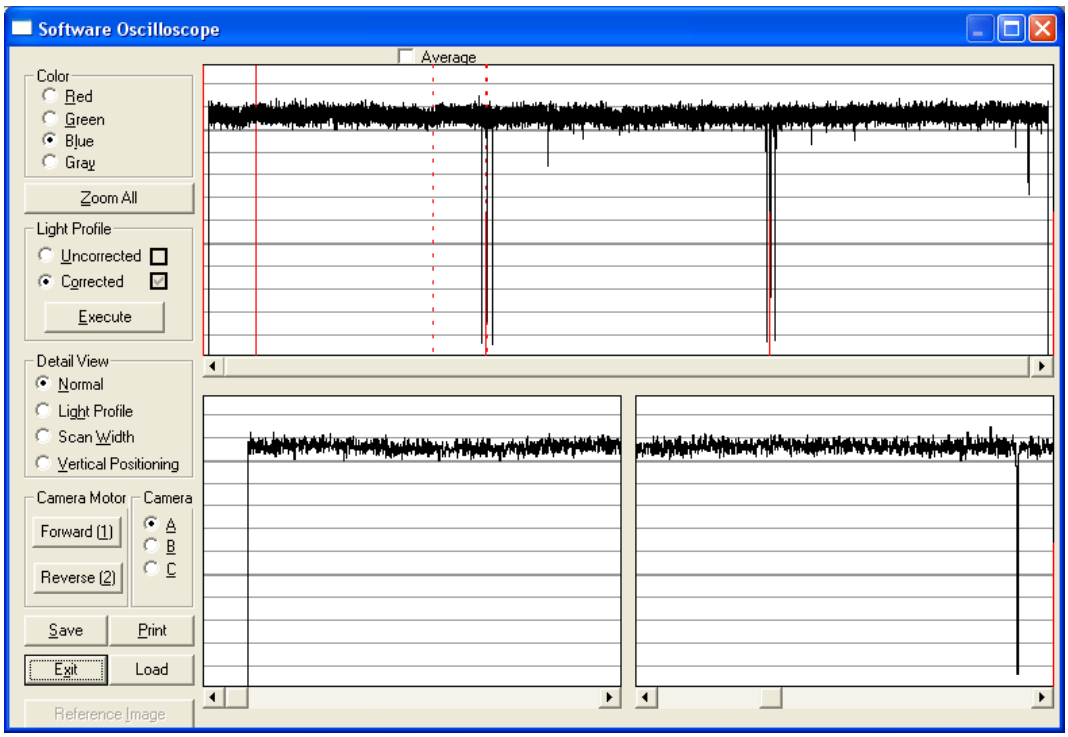


Fig. 4-6, Corrected Light Profiles, KA67E, KH67E, KK67E

4.4.2 Check of Light Profiles, 4C42" (KC67E, KE67E, KF67E, KM67E)

The uncorrected and corrected light profiles are shown for reference below.

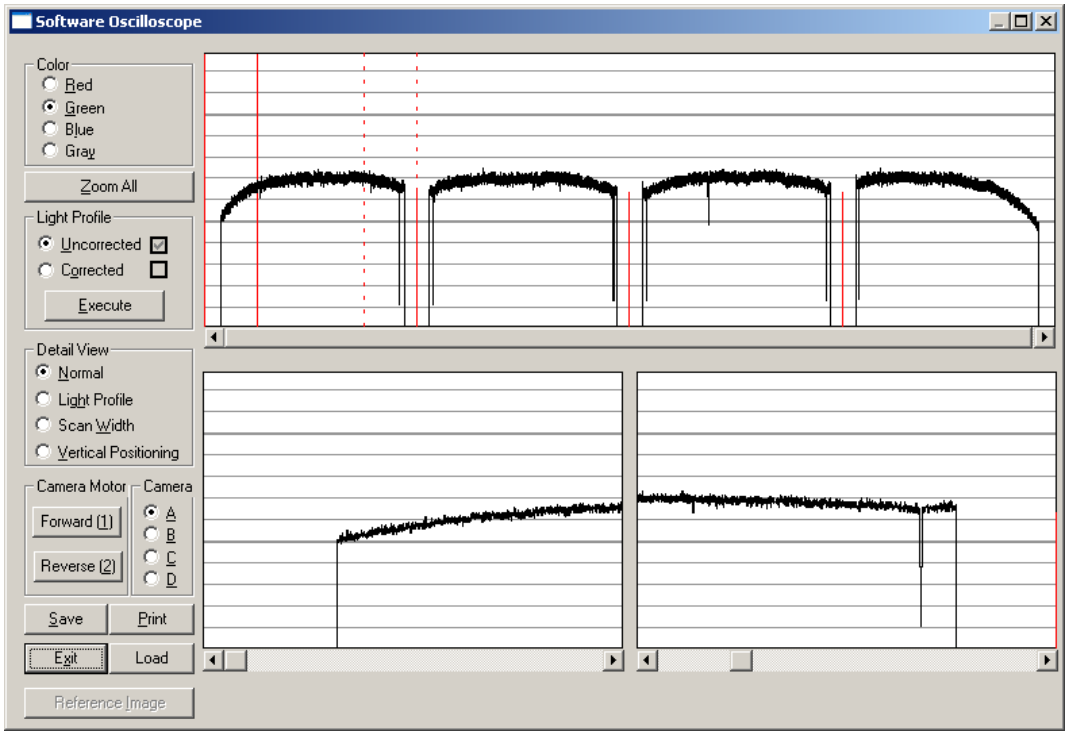


Fig. 4-7, Uncorrected Light Profile, KC67E, KE67E, KF67E, KM67E

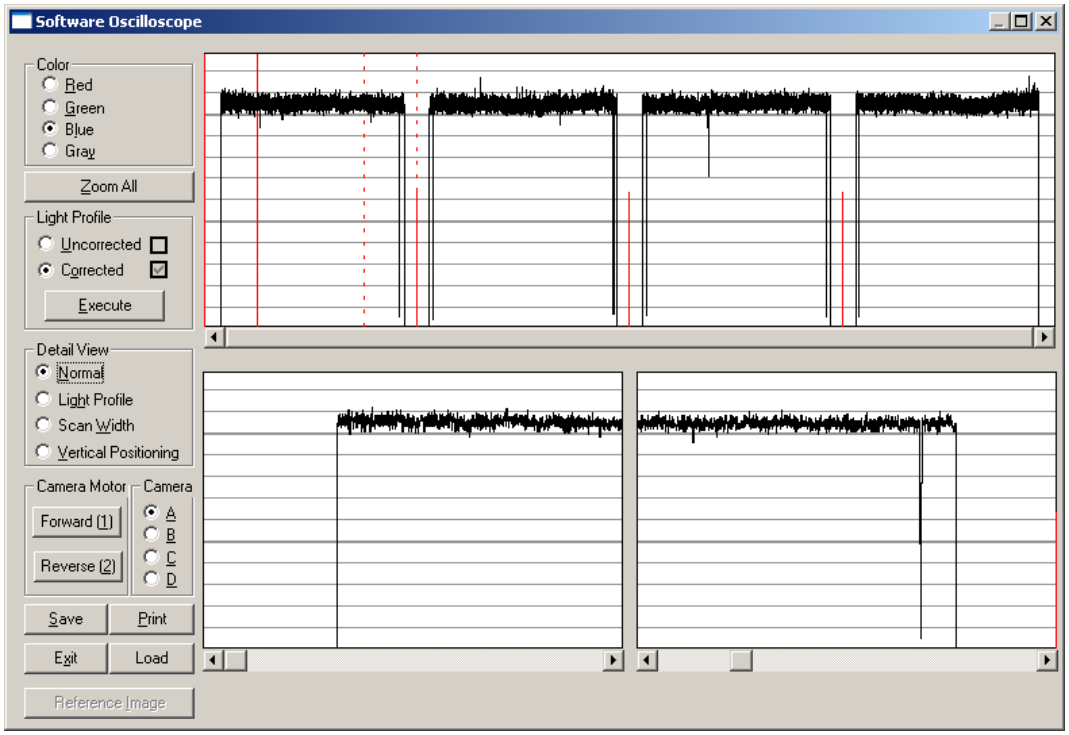


Fig. 4-8, Corrected Light Profile, KC67E, KE67E, KF67E, KM67E

4.4.3 Check of Light Profiles, 4C54" (KD67E, KN67E)

The uncorrected and corrected light profiles are shown for reference below.

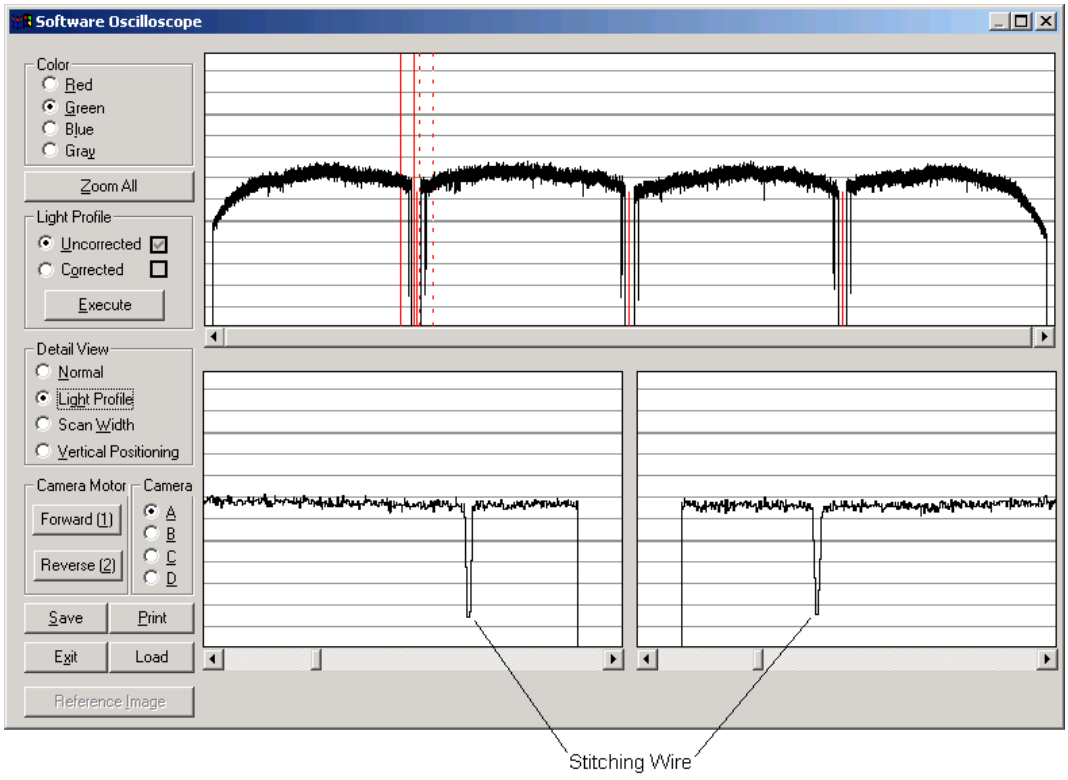


Fig. 4-9, Uncorrected Light Profile, KD67E, KN67E

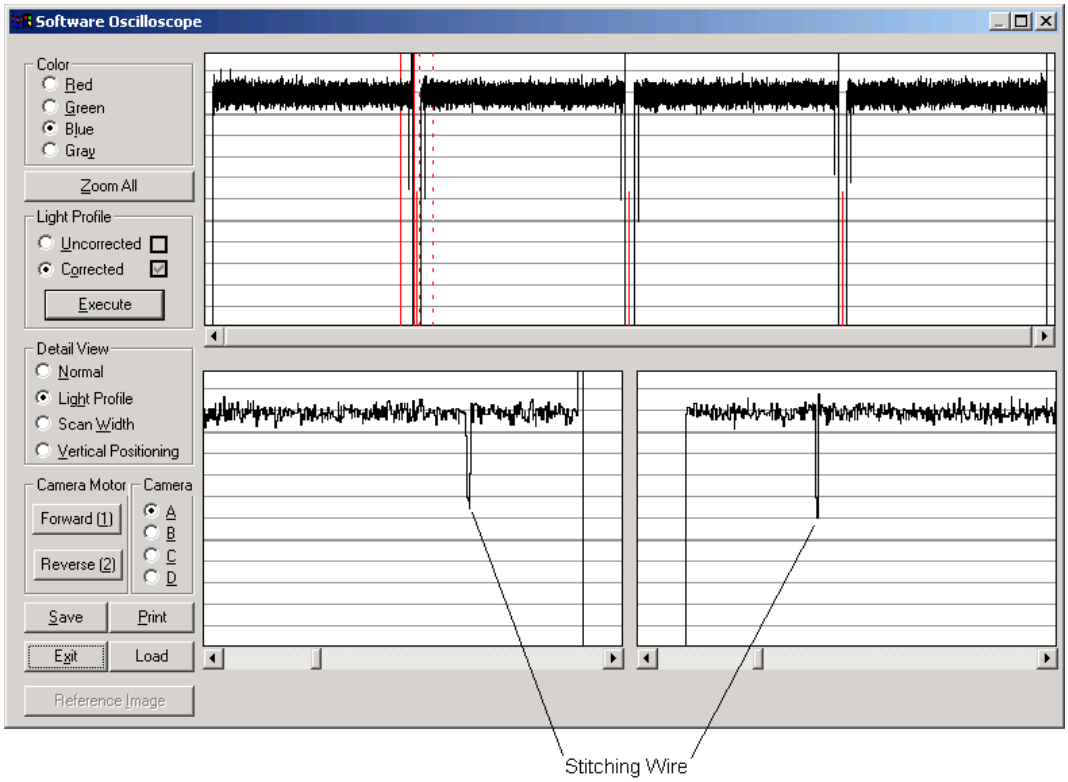


Fig. 4-10, Corrected Light Profile, KD67E, KN67E

4.4.4 Check of Light Profiles, 1C25" (KL67E)

The uncorrected and corrected light profiles are shown for reference below.

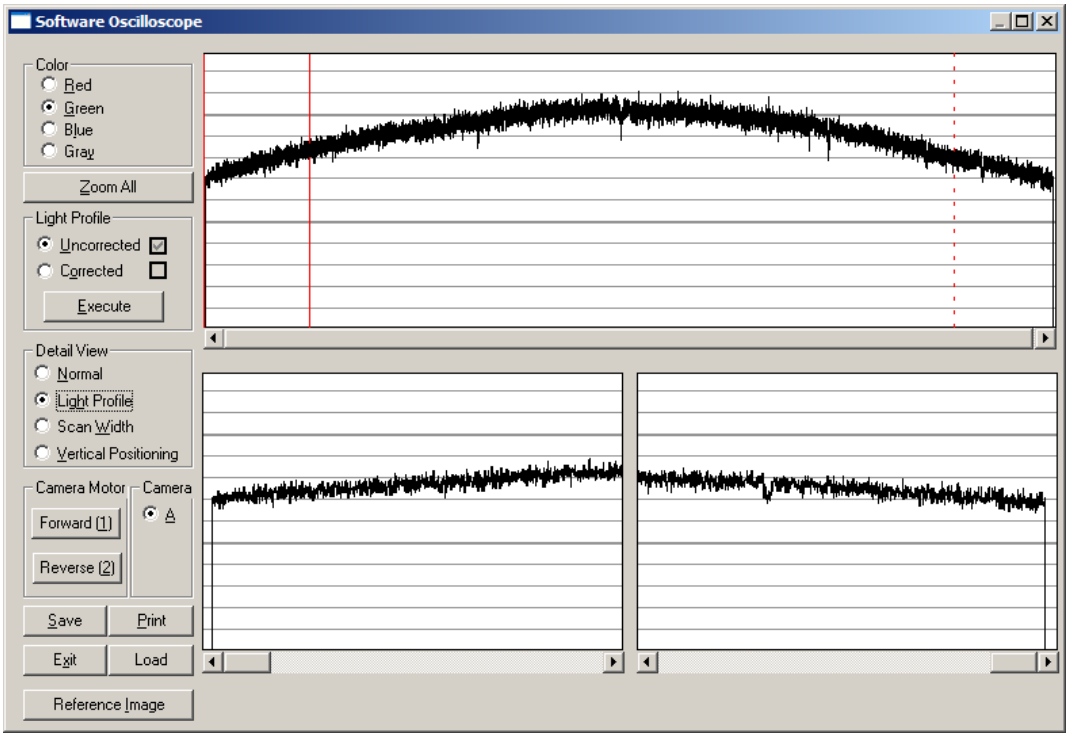


Fig. 4-11, Uncorrected Light Profile, KL67E

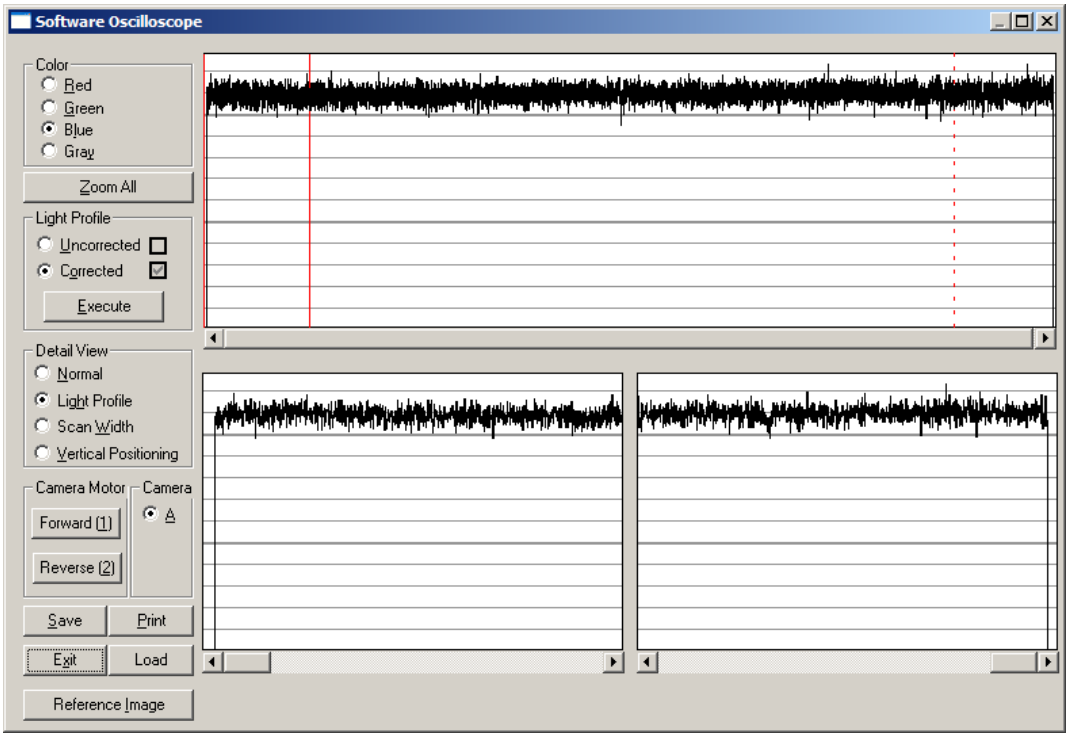


Fig. 4-12, Corrected Light Profile, KL67E

4.4.5 Check and Adjustment of Focus, 3C36" (KA67E, KH67E, KK67E)

IMPORTANT: The focus adjustment is factory optimized for all three colors (Red, Green and Blue) which may cause that the focus signal for Blue is not as even as it could be.
Only change the focus adjustment if it is absolutely necessary, i.e. if the Scan-Width is not within the limits given in 4.4.9.

Refer to FSG/TSM/001 for adjustment procedure

IMPORTANT: After replacement of the Camera Board (CBx) check the Scan-Width. It is ONLY necessary to adjust the focus if the Scan-Width is not within the limits given in 4.4.9.

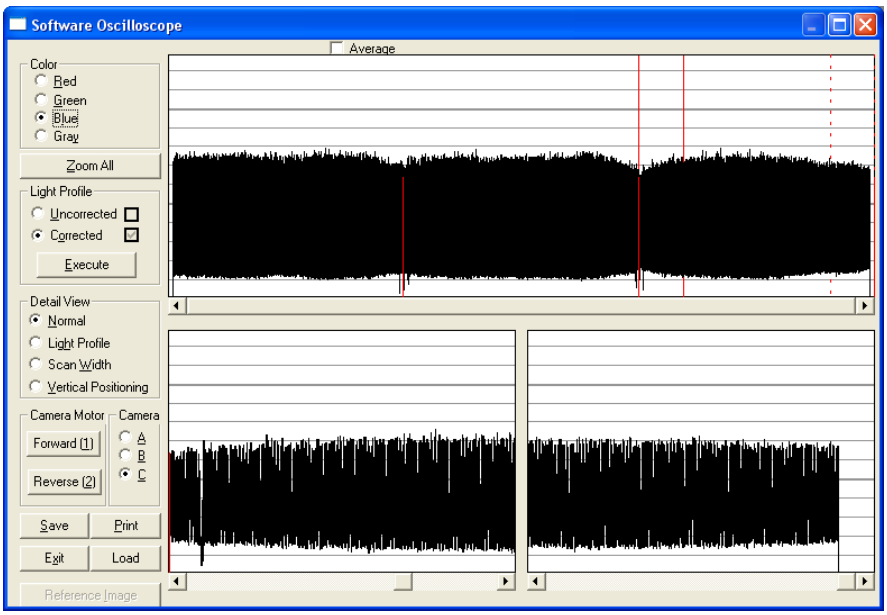


Fig. 4-13, Focus Signal (Blue Channel), KA67E, KH67E, KK67E

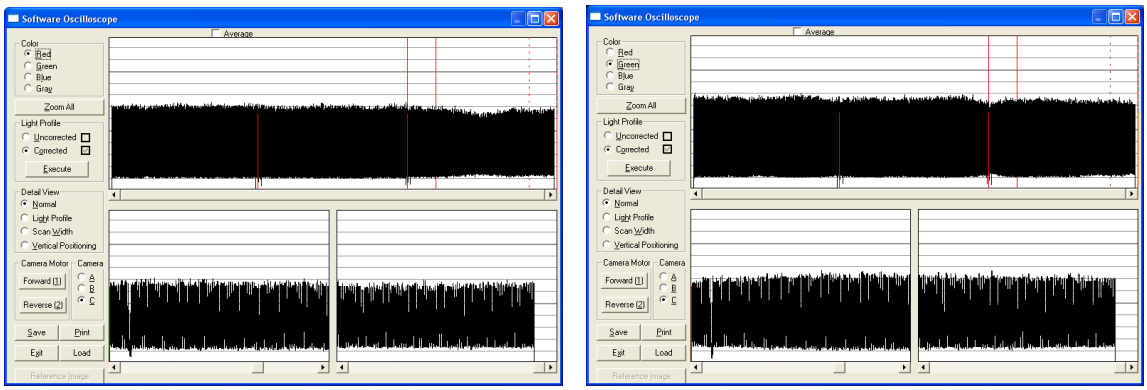


Fig. 4-14, Focus Signals (Red and Green Channel), KA67E, KH67E, KK67E

Interaction
The Focus adjustment has a big influence on the Scan-Width adjustment. Therefore the Scan-Width must be checked and readjusted if necessary when the Focus adjustment has been changed. On the other hand, the Focus adjustment is relative tolerant to changes in the Scan-Width adjustment and as a rule of thumb, the Scan-Width adjustment can be changed ±1 SWU without the need for re-focusing.

When all camera adjustments have been completed, run Scanner Maintenance.

4.4.6 Check and Adjustment of Focus, 4C42" (KC67E, KE67E, KF67E, KM67E)

IMPORTANT: The focus adjustment is factory optimized for all three colors (Red, Green and Blue) which may cause that the focus signal for Blue is not as even as it could be.
Only change the focus adjustment if it is absolutely necessary, i.e. if the Scan-Width is not within the limits given in 4.4.9.

Refer to FSG/TSM/001 for adjustment procedure

IMPORTANT: After replacement of the Camera Board (CBx) check the Scan-Width. It is ONLY necessary to adjust the focus if the Scan-Width is not within the limits given in 4.4.9.

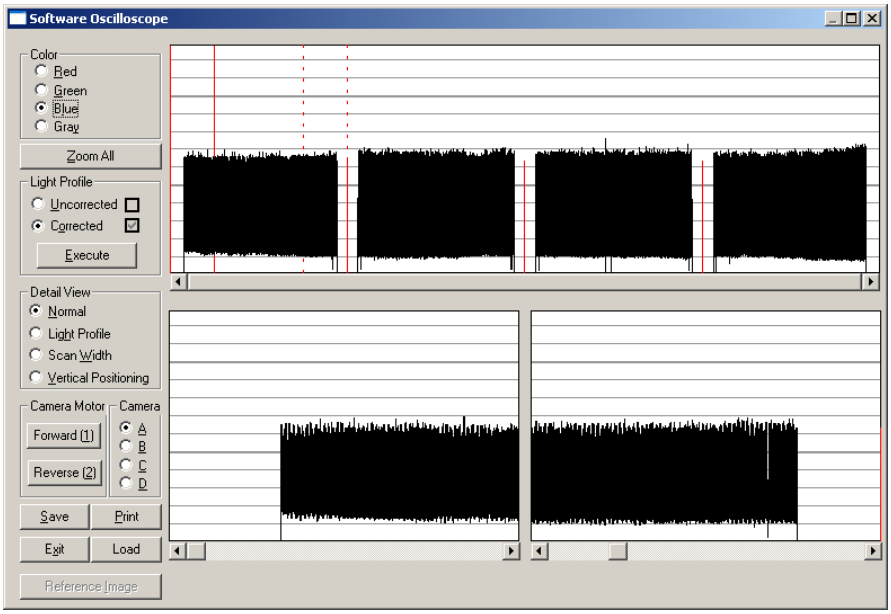


Fig. 4-15, Focus Signal (Blue Channel), KC67E, KE67E, KF67E, KM67E

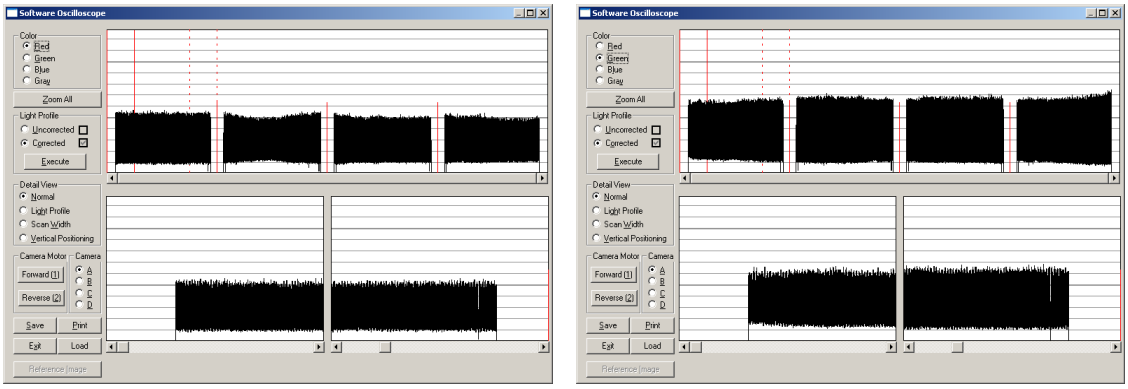


Fig. 4-16, Focus Signals (Red and Green Channel), KC67E, KE67E, KF67E, KM67E

Interaction
The Focus adjustment has a big influence on the Scan-Width adjustment. Therefore the Scan-Width must be checked and readjusted if necessary when the Focus adjustment has been changed. On the other hand, the Focus adjustment is relative tolerant to changes in the Scan-Width adjustment and as a rule of thumb, the Scan-Width adjustment can be changed ±1 SWU without the need for re-focusing.

When all camera adjustments have been completed, run Scanner Maintenance.

4.4.7 Check and Adjustment of Focus, 4C54" (KD67E, KN67E)

IMPORTANT: The focus adjustment is factory optimized for all three colors (Red, Green and Blue) which may cause that the focus signal for Blue is not as even as it could be.
Only change the focus adjustment if it is absolutely necessary, i.e. if the Scan-Width is not within the limits given in 4.4.9.

Refer to FSG/TSM/001 for detailed adjustment procedure
Focus Pattern 6779D228R01 (3.3lp/mm)

IMPORTANT: After replacement of the Camera Board (CBx) check the Scan-Width. It is ONLY necessary to adjust the focus if the Scan-Width is not within the limits given in 4.4.9.

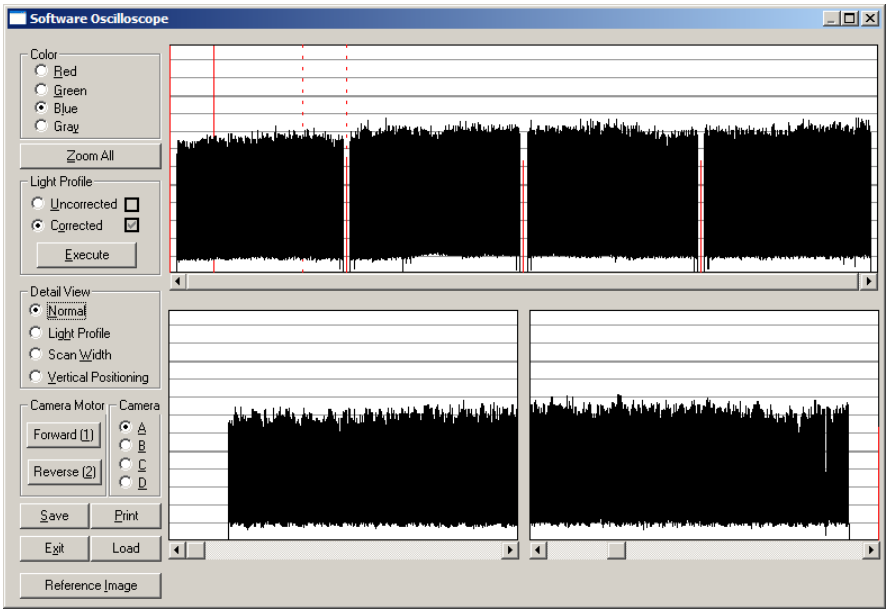


Fig. 4-17, Focus Signal (Blue Channel), KD67E, KN67E

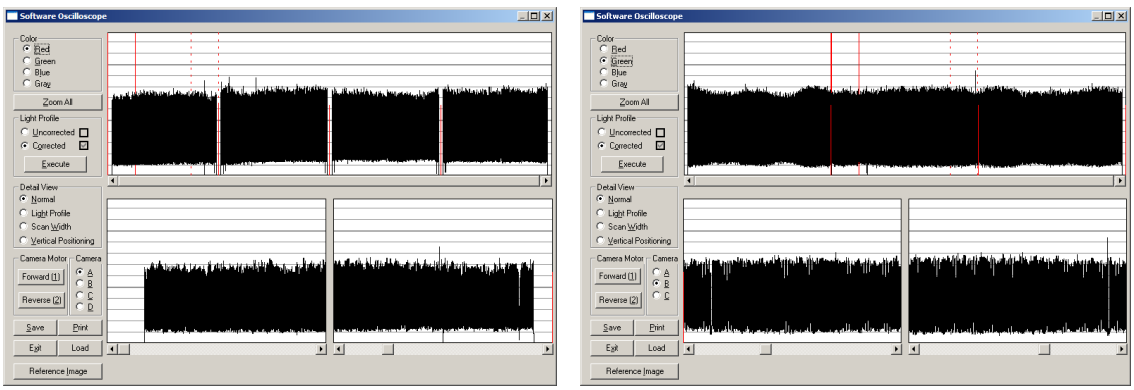


Fig. 4-18, Focus Signals (Red and Green Channel), KD67E, KN67E

Interaction
The Focus adjustment has a big influence on the Scan-Width adjustment. Therefore the Scan-Width must be checked and readjusted if necessary when the Focus adjustment has been changed. On the other hand, the Focus adjustment is relative tolerant to changes in the Scan-Width adjustment and as a rule of thumb, the Scan-Width adjustment can be changed ±1 SWU without the need for re-focusing.

When all camera adjustments have been completed, run Scanner Maintenance.

4.4.8 Check and Adjustment of Focus, 1C25" (KL67E)

IMPORTANT: The focus adjustment is factory optimized for all three colors (Red, Green and Blue) which may cause that the focus signal for Blue is not as even as it could be.
Only change the focus adjustment if it is absolutely necessary, i.e. if the Scan-Width is not within the limits given in 4.4.9.

Refer to FSG/TSM/001 for detailed adjustment procedure
Focus Pattern 6779D215R01 (3.3lp/mm)

IMPORTANT: After replacement of the Camera Board (CBx) check the Scan-Width. It is ONLY necessary to adjust the focus if the Scan-Width is not within the limits given in 4.4.9.

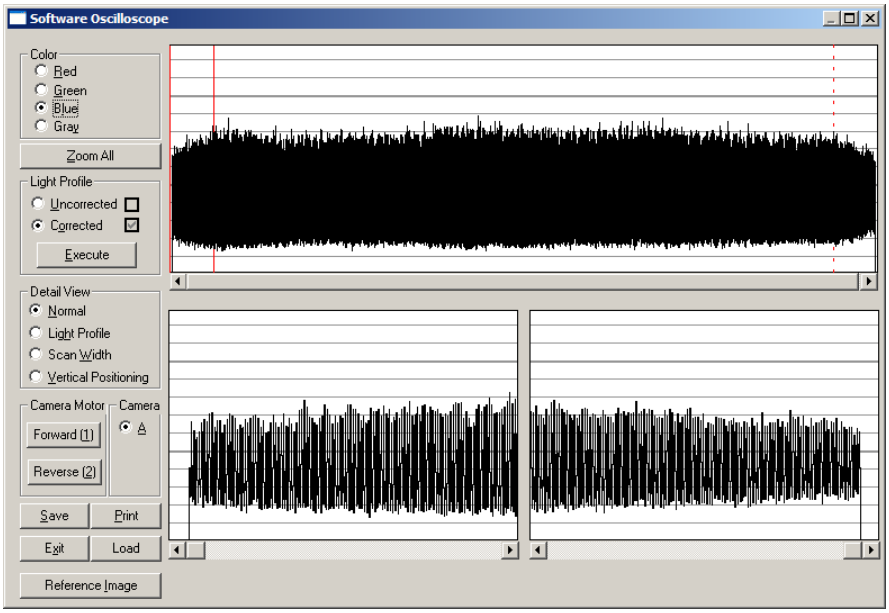


Fig. 4-19, Focus Signal (Blue Channel), KL67E

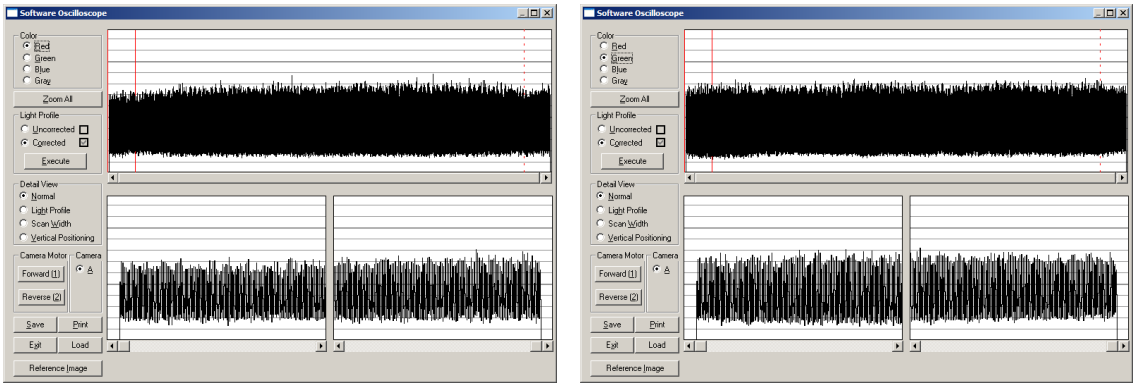


Fig. 4-20, Focus Signals (Red and Green Channel), KL67E

Interaction
The Focus adjustment has a big influence on the Scan-Width adjustment. Therefore the Scan-Width must be checked and readjusted if necessary when the Focus adjustment has been changed. On the other hand, the Focus adjustment is relative tolerant to changes in the Scan-Width adjustment and as a rule of thumb, the Scan-Width adjustment can be changed ±1 SWU without the need for re-focusing.

When all camera adjustments have been completed, run Scanner Maintenance.

4.4.9 Check and Adjustment of Scan-Width

Refer to FSG/TSM/001 for adjustment procedure

Model	Type	Camera Adj. Screen Dumps	Optical Adjustment Pattern
KA67E KH67E KK67E	3C36"	Fig. 4-21 to Fig. 4-23	Fig. 4-33
KC67E KE67E KF67E KM67E	4C42"	Fig. 4-25 to Fig. 4-27	Fig. 4-34
KD67E KN67E	4C54"	Fig. 4-28 to Fig. 4-31	Fig. 4-35
KL67E	1C25"	Fig. 4-32	Fig. 4-36

The aim of this adjustment is to obtain a *camera* Scan-Width of:

1C25"	635 mm
3C36"	311,15/317,5/311,15 mm
4C42"	273,05/279,40/279,40/273,05 mm
4C54"	350.9/358.9/358.9/350.9 mm

The Scan-Width is correct if the total sum of Scan-Width Units (SWU) at the start and at the end of the scanline is as shown in the table below (*1 SWU is either 1 Black Line or 1 White Space of the Scan-Width Pattern (A*)).

Model	Type	Optical Adjustment Pattern	Total sum of Scan-Width Units	Tolerance
KA67E KH67E KK67E	3C36"	6779D138, sub-pattern A	6	±0.5 SWU
KC67E KE67E KF67E KM67E	4C42"	6779D144, sub-pattern A	6	±0.5 SWU
KD67E KN67E	4C54"	6779D130, sub-pattern A	6	±0.5 SWU
KL67E	1C25"	6779D105, sub-pattern A	6	±0.5 SWU

The tolerance corresponds to approximately 0.10% on the Scan-Width (scaling error).

When all camera adjustments have been completed, run Scanner Maintenance.

4.4.10 Check and Adjustment of CCD-Centering

Refer to FSG/TSM/001 for adjustment procedure

Model	Type	Camera Adj. Screen Dumps	Optical Adjustment Pattern
KA67E KH67E KK67E	3C36"	Fig. 4-21 to Fig. 4-23	Fig. 4-33
KC67E KE67E KF67E KM67E	4C42"	Fig. 4-25 to Fig. 4-27	Fig. 4-34
KD67E KN67E	4C54"	Fig. 4-28 to Fig. 4-31	Fig. 4-35
KL67E	1C25"	Fig. 4-32	Fig. 4-36

The aim of this adjustment is to position the field of vision of the CCD-Camera symmetrically with respect to the Scan-Width Adjustment Patterns.
The Black Lines and White Spaces of the Scan-Width Patterns should be distributed symmetrically with the following number of Scan-Width Units at both ends of the scanline:

Model	Type	Optical Adjustment Pattern	No of Scan-Width Units, start	No of Scan-Width Units, end	Tolerance
KA67E KH67E KK67E	3C36"	6779D138, sub-pattern A	3	3	± 1 SWU
KC67E KE67E KF67E KM67E	4C42"	6779D144, sub-pattern A	3	3	± 1 SWU
KD67E KN67E	4C54"	6779D130, sub-pattern A	3	3	± 1 SWU
KL67E	1C25"	6779D105, sub-pattern A	3	3	± 1 SWU

The tolerance on the CCD-Centering means that the image may be shifted ± 1 SWU.
Note: The total number of Scan Width Units must be 6 ± 0.5, see section 4.4.9.

Interaction
Check Vertical Position.
After completing all camera adjustments, run Scanner Maintenance.

4.4.11 Check and Adjustment of Vertical Positioning

Refer to FSG/MTM/001 for adjustment procedure

Model	Type	Camera Adj. Screen Dumps	Optical Adjustment Pattern
KA67E KH67E KK67E	3C36"	Fig. 4-21 to Fig. 4-23	Fig. 4-33
KC67E KE67E KF67E KM67E	4C42"	Fig. 4-25 to Fig. 4-27	Fig. 4-34
KD67E KN67E	4C54"	Fig. 4-28 to Fig. 4-31	Fig. 4-35
KL67E	1C25"	Fig. 4-32	Fig. 4-36

Fig. 4-21 to Fig. 4-27 show screen dumps of the camera adjustments
Fig. 4-33 to Fig. 4-34 shows the Optical Adjustment Patterns

The aim of this adjustment is to place the scanline in the correct “Vertical Position” within the scan-area, and to ensure that the scanline is “horizontal”.

The Vertical Positioning of the CCD-Cameras is based on the number of black lines of the Vertical Position Pattern that crosses the scanline. The step height of the Black Lines in the Vertical Position Pattern is shown in the table following:

Model	Type	Optical Adjustment Pattern	Step Height of Black Lines	Step Height 0 through 16 Black Lines
KA67E KH67E KK67E	3C36"	6779D138, sub-pattern B	0,15 mm	2,25 mm
KC67E KE67E KF67E KM67E	4C42"	6779D144, sub-pattern B	0,15 mm	2,25 mm
KD67E KN67E	4C54"	6779D130, sub-pattern B	0,15 mm	2,25 mm
KL67E	1C25"	6779D105, sub-pattern B	0,15 mm	2,25 mm

The cameras are adjusted to 8 Black Lines of the Vertical Position Pattern at both ends of the scanlines.

Interaction
After completing all camera adjustments, run Scanner Maintenance.

4.4.12 Final Check

As the above adjustments interact:
Check, and if necessary readjust steps 4.4.5 through 4.4.11

4.4.13 Camera Adjustment Screen Dumps, 3C36" (KA67E, KH67E, KK67E)

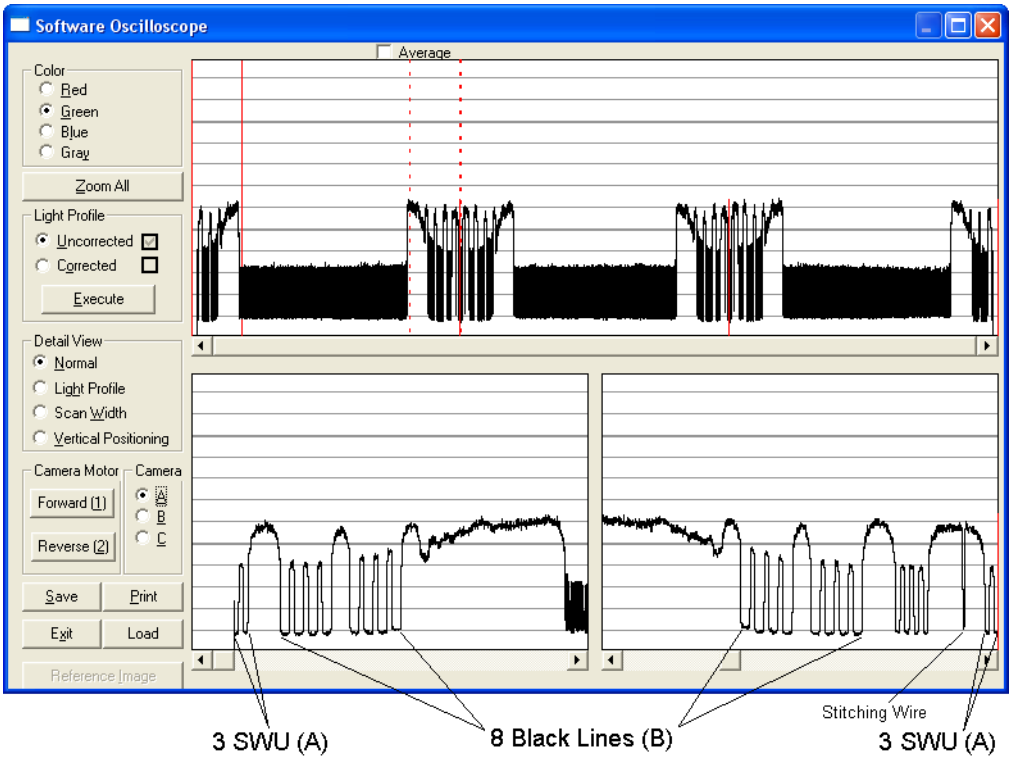


Fig. 4-21, Camera A Screen Dump, 3C36"
(Scan-Width, CCD-Centering and Vertical Positioning)

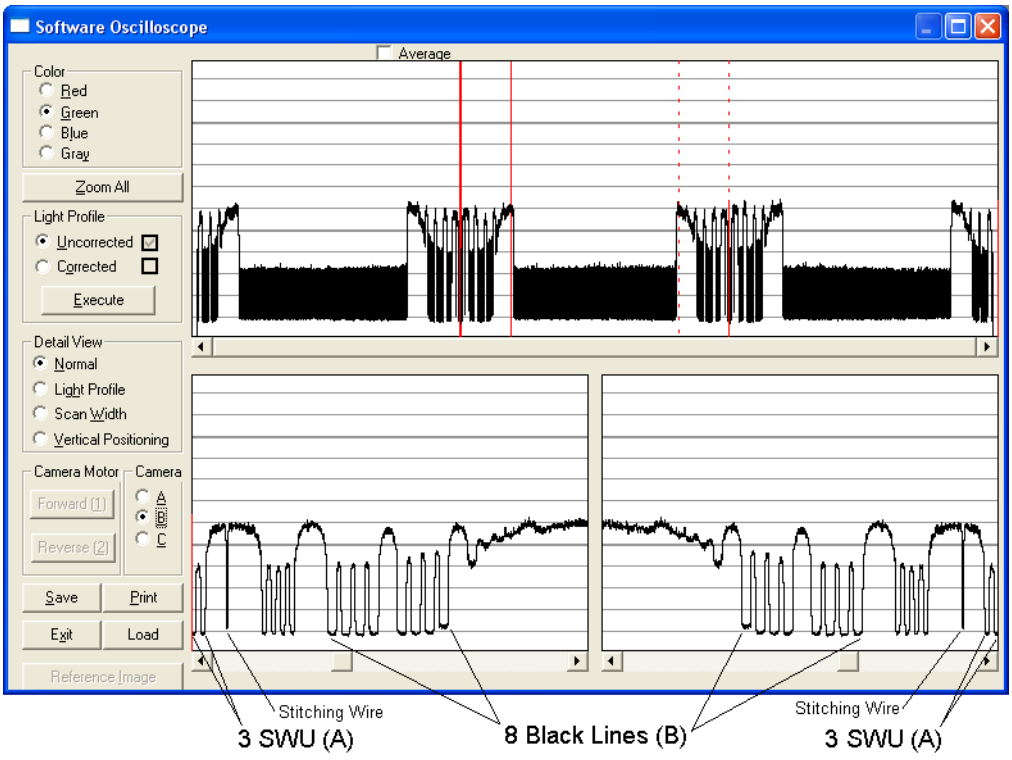


Fig. 4-22, Camera B Screen Dump, 3C36"
(Scan-Width, CCD-Centering and Vertical Positioning)

Camera Adjustment Screen Dumps, 3C36" (KA67E, KH67E, KK67E) continued

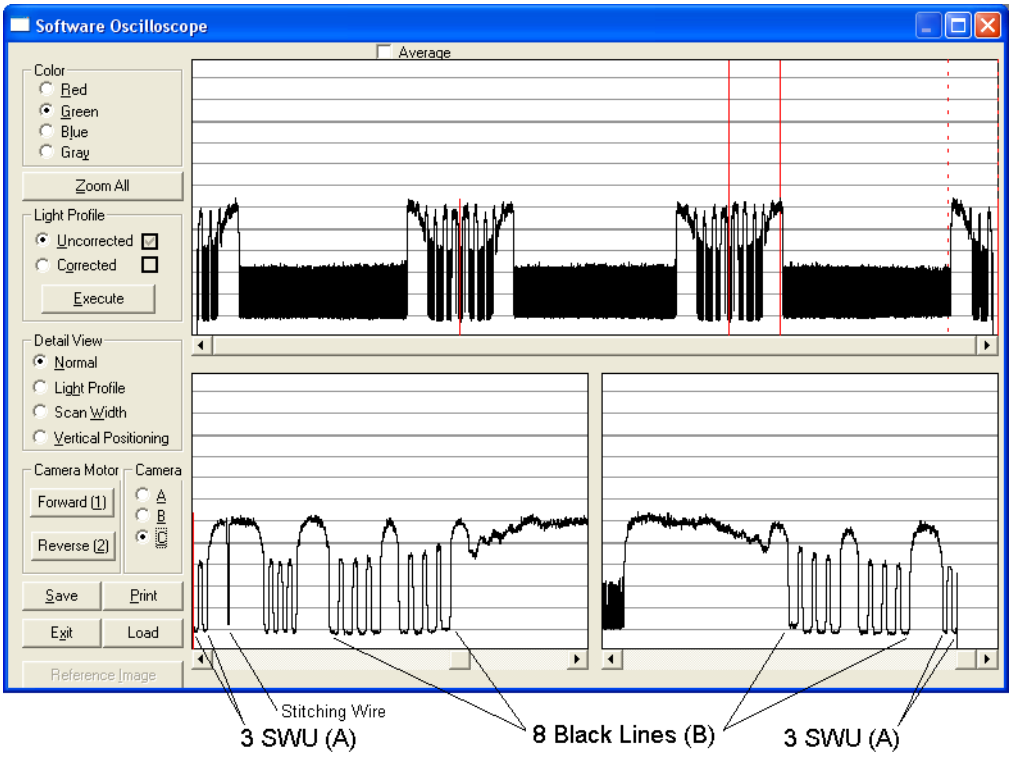


Fig. 4-23, Camera C Screen Dump, 3C36"
(Scan-Width, CCD-Centering and Vertical Positioning)

4.4.14 Camera Adjustment Screen Dumps, 4C42" (KC67E, KE67E, KF67E, KM67E)

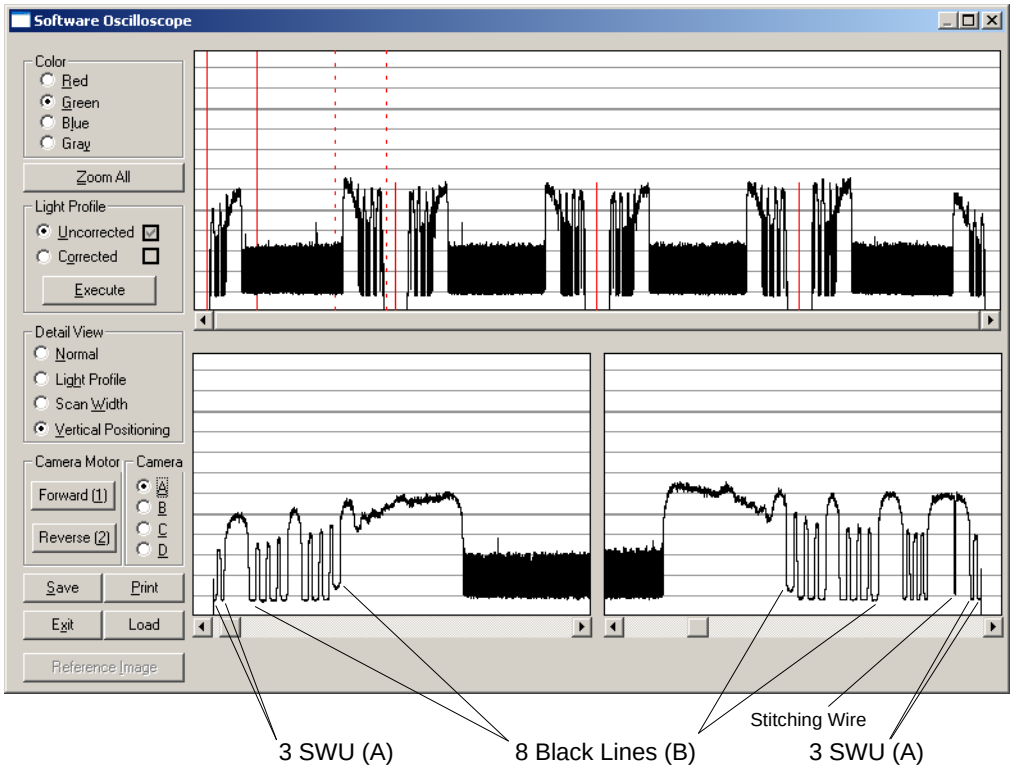


Fig. 4-24, Camera A Screen Dump, 4C42"
(Scan-Width, CCD-Centering and Vertical Positioning)

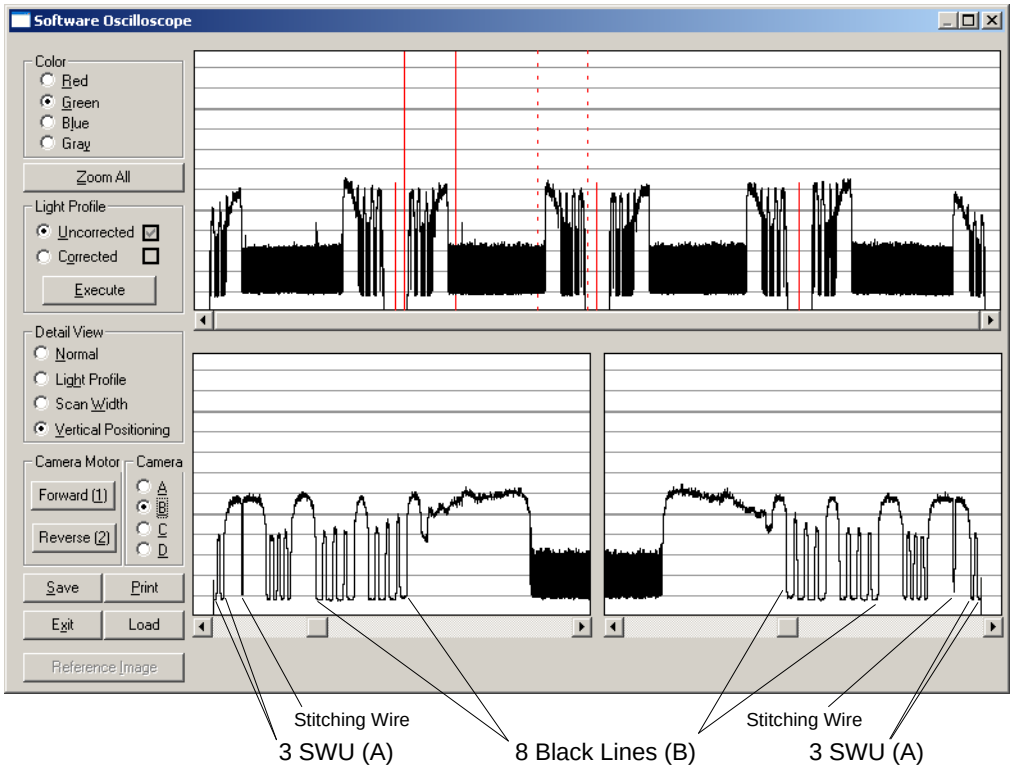


Fig. 4-25, Camera B Screen Dump, 4C42"
(Scan-Width, CCD-Centering and Vertical Positioning)

Camera Adjustment Screen Dumps, 4C42" (KC67E, KE67E, KF67E, KM67E) continued

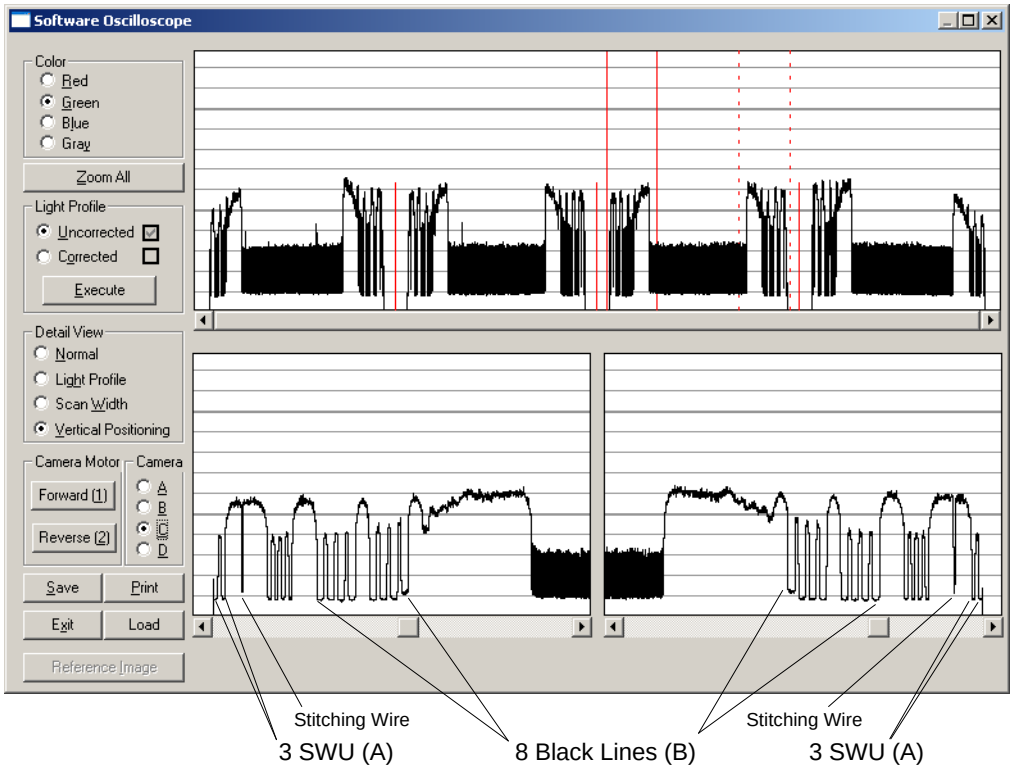


Fig. 4-26, Camera C Screen Dump, 4C42"
(Scan-Width, CCD-Centering and Vertical Positioning)

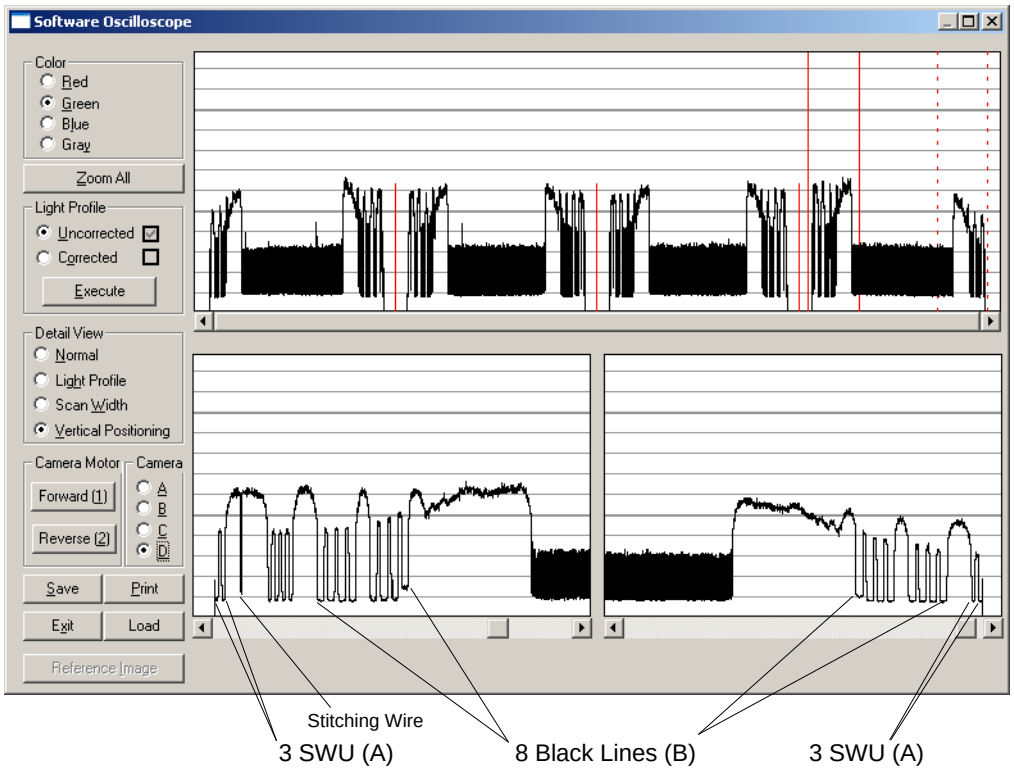


Fig. 4-27, Camera D Screen Dump, 4C42"
(Scan-Width, CCD-Centering and Vertical Positioning)

4.4.15 Camera Adjustment Screen Dumps, 4C54" (KD67E, KN67E)

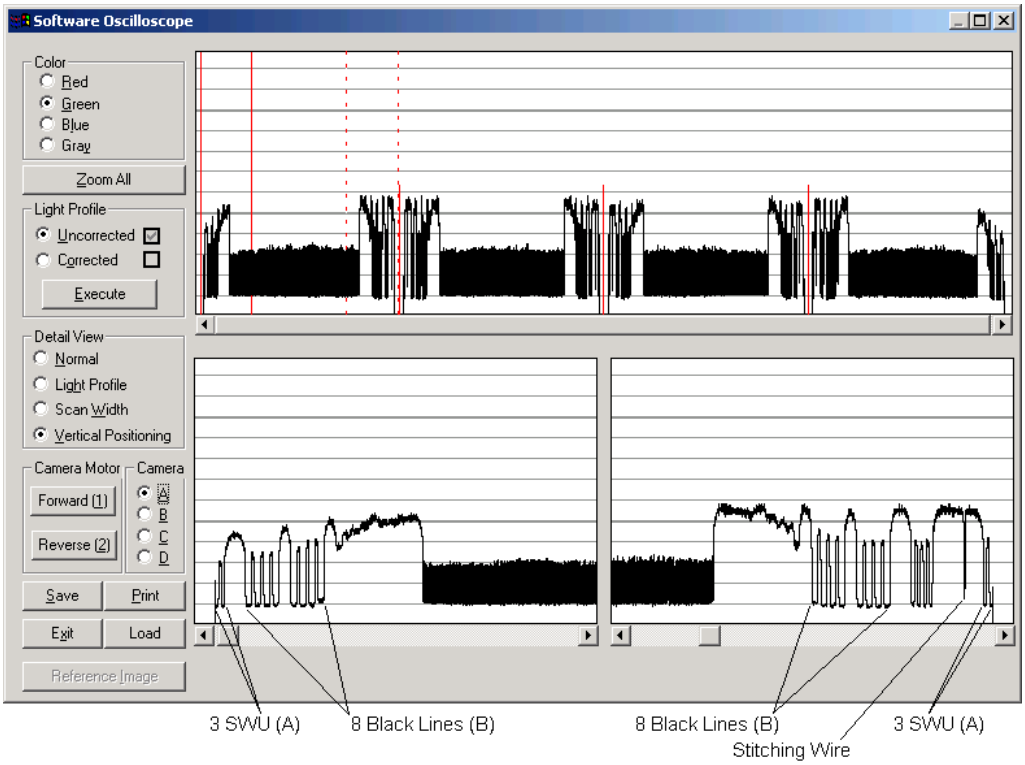


Fig. 4-28, Camera A Screen Dump, 4C54"
(Scan-Width, CCD-Centering and Vertical Positioning)

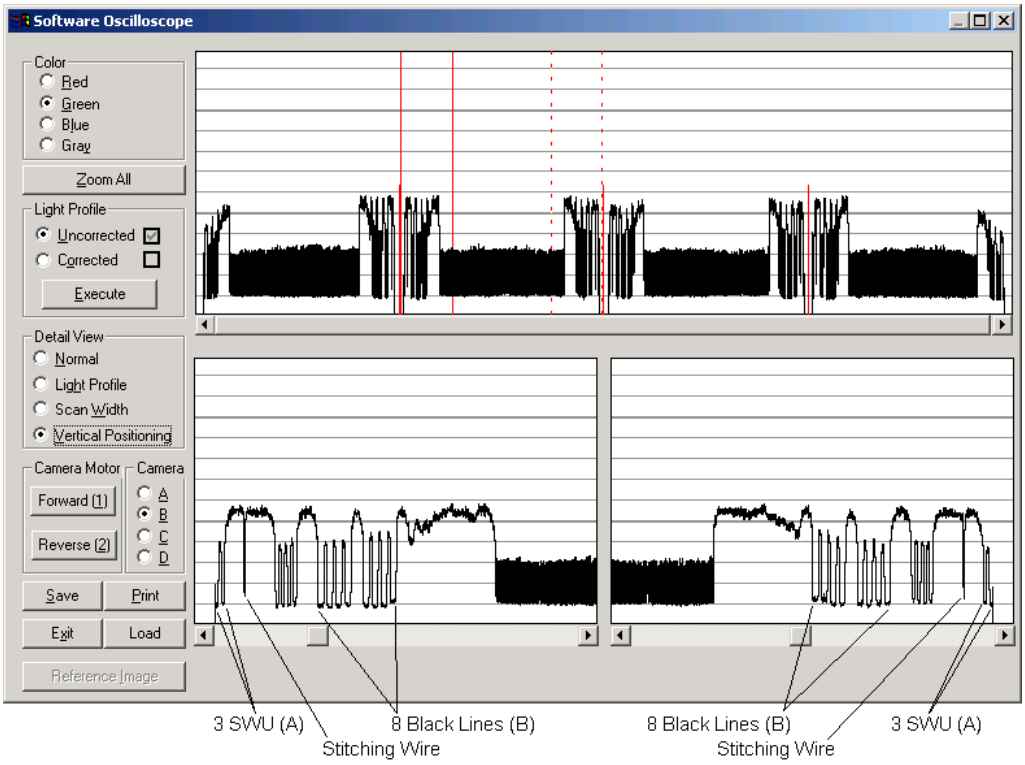


Fig. 4-29, Camera B Screen Dump, 4C54"
(Scan-Width, CCD-Centering and Vertical Positioning)

Camera Adjustment Screen Dumps, 4C54" (KD67E, KN67E) continued

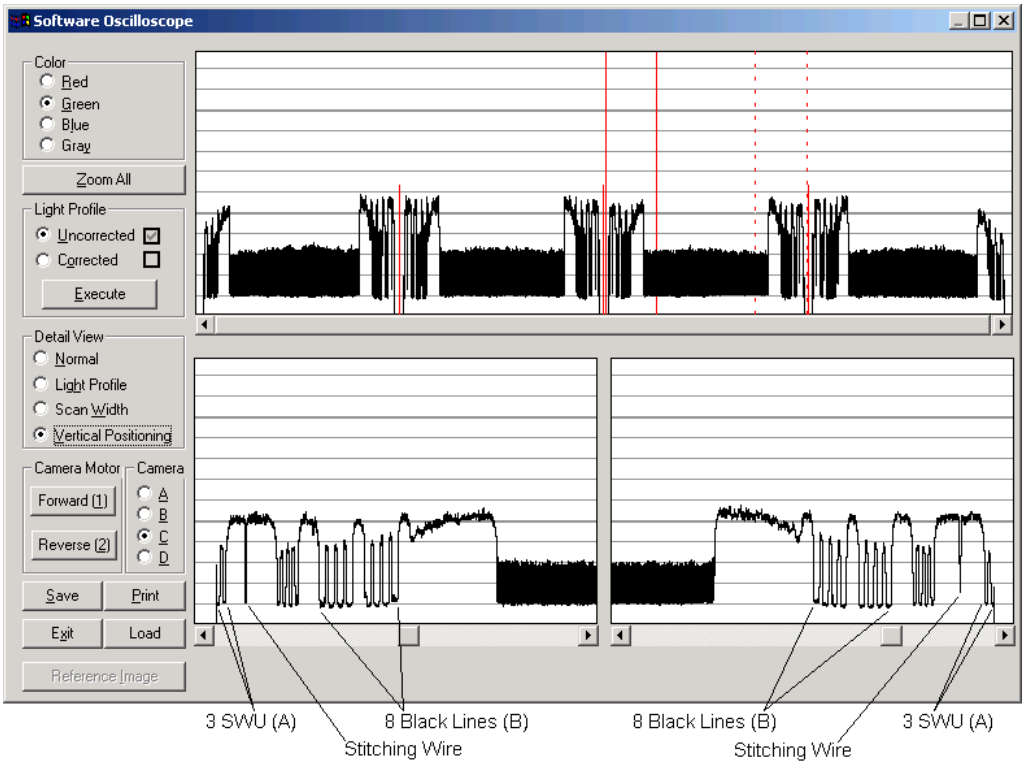


Fig. 4-30, Camera C Screen Dump, 4C54"
(Scan-Width, CCD-Centering and Vertical Positioning)

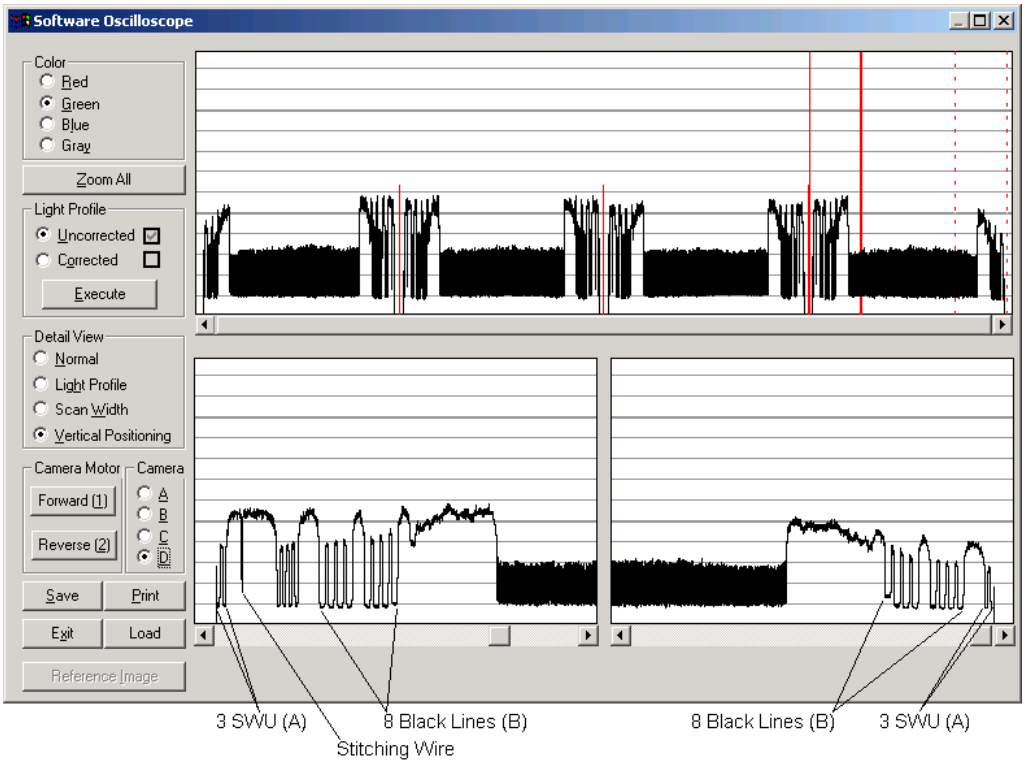


Fig. 4-31, Camera D Screen Dump, 4C54"
(Scan-Width, CCD-Centering and Vertical Positioning)

4.4.16 Camera Adjustment Screen Dumps, 1C25” (KL67E)

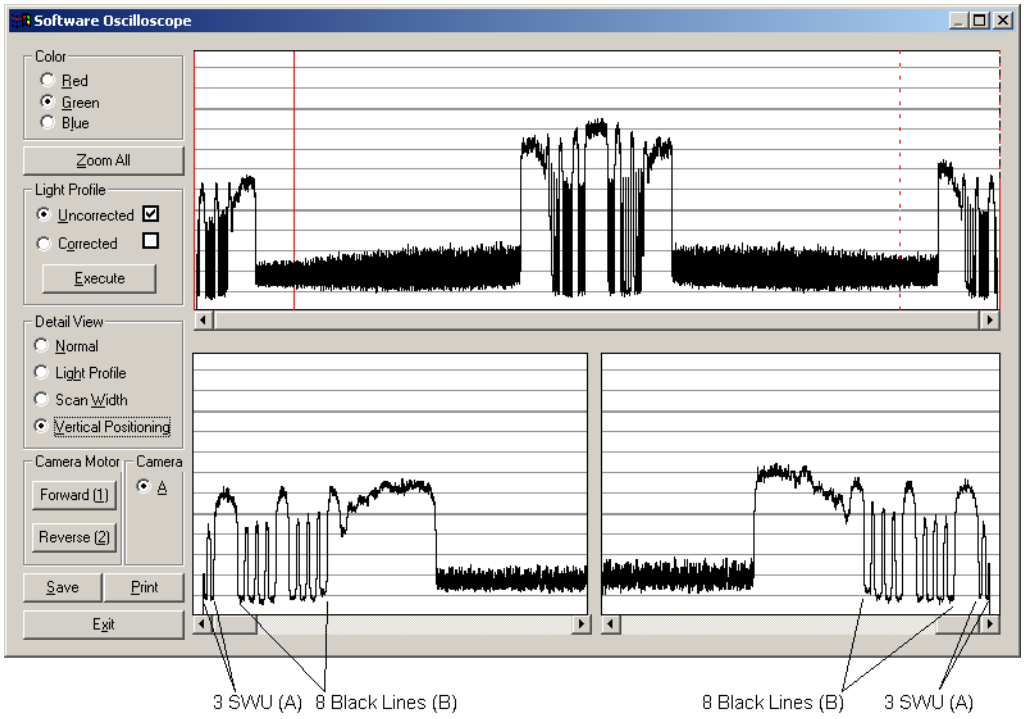
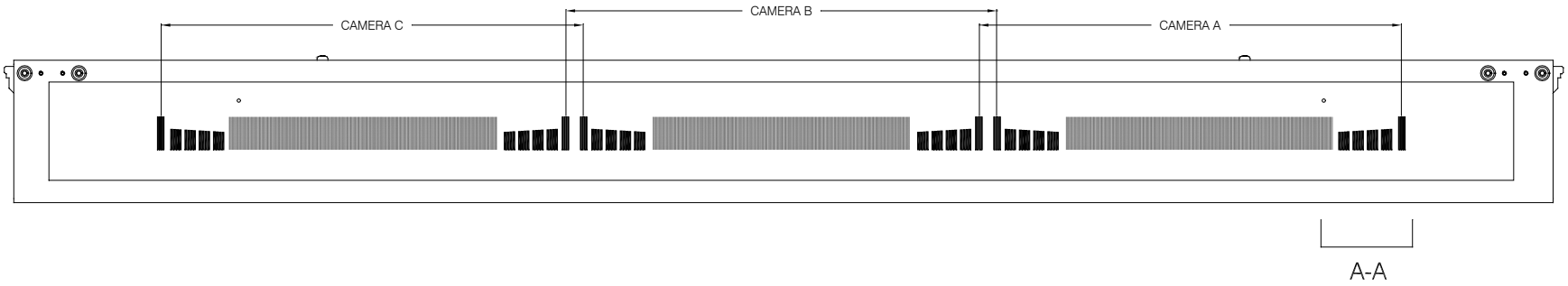
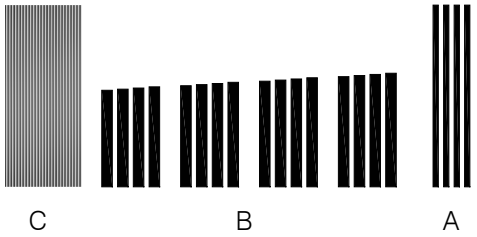


Fig. 4-32, Camera A Screen Dump, 1C25”
(Scan-Width, CCD-Centering and Vertical Positioning)

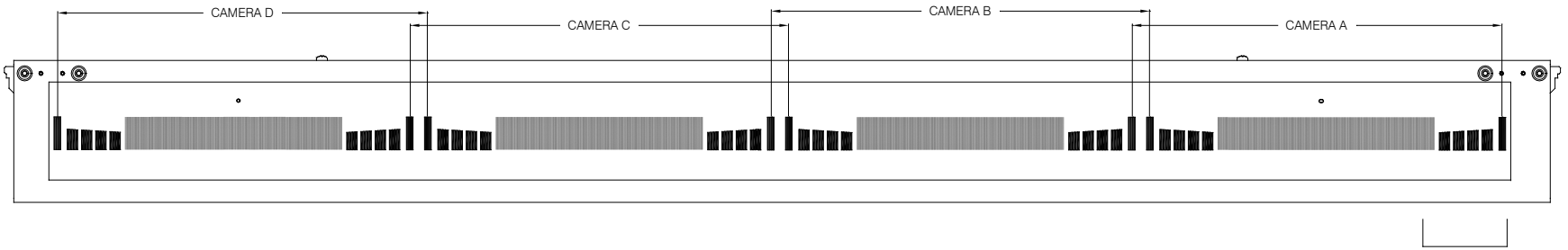


Sub-pattern A: Scan-Width Patterns
Sub-pattern B: Vertical Position Patterns
Sub-pattern C: Focus Pattern (used for coarse Focus adjustment)



Detail A-A

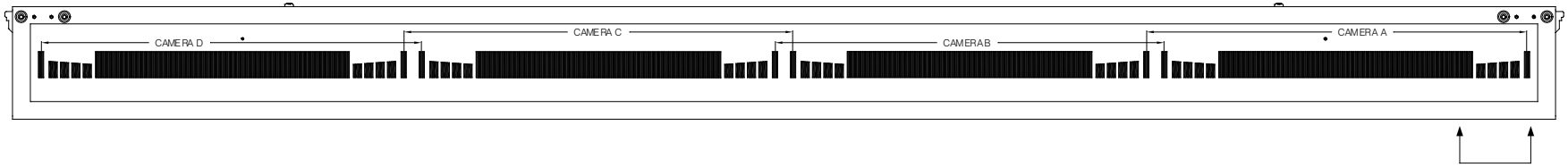
Fig. 4-33, 3C36” Optical Adjustment Pattern
(Used with KA67E, KH67E, KK67E)



Sub-pattern A: Scan-Width Patterns
Sub-pattern B: Vertical Position Patterns
Sub-pattern C: Focus Pattern (used for coarse Focus adjustment)

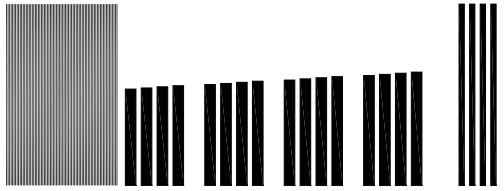
Detail A-A

Fig. 4-34, 4C42” Optical Adjustment Pattern
(Used with KC67E, KE67E, KF67E, KM67E)



Sub-pattern A: Scan-Width Patterns
Sub-pattern B: Vertical Position Patterns
Sub-pattern C: Focus Pattern (used for coarse Focus adjustment)

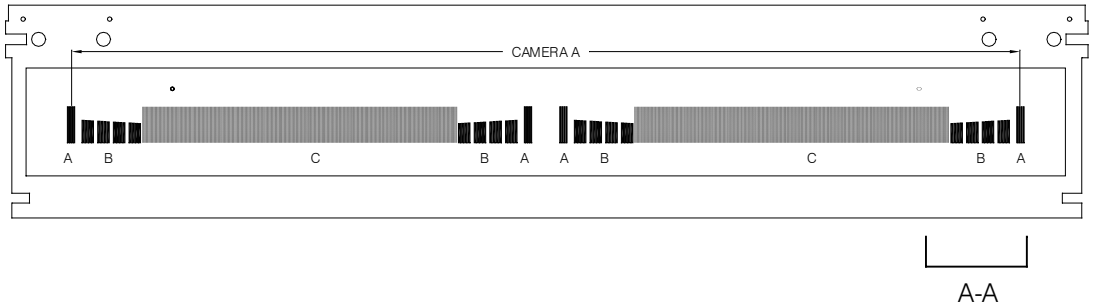
A-A



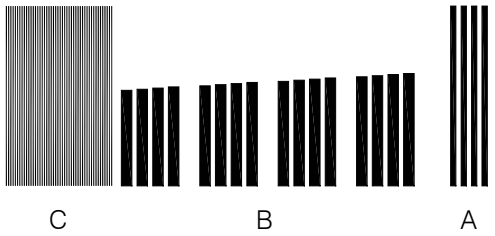
Detail A-A

Fig. 4-35, 4C54” Optical Adjustment Pattern

(Used with KD67E, KN67E)



Sub-pattern A: Scan-Width Patterns
Sub-pattern B: Vertical Position Patterns
Sub-pattern C: Focus Pattern (used for coarse Focus adjustment)



Detail A-A

Fig. 4-36, 1C25” Optical Adjustment Pattern
(Used with KL67E)

5. Scanner Maintenance

When running Scanner Maintenance, the cameras are first automatically Vertically Aligned* and Horizontally Stitched*, next the scanner is Basic Calibrated using the White and Black Calibration Areas of the SM Calibration Sheet, and finally the scanner is Color Calibrated** using the IT8 Chart of the SM Calibration Sheet.

* Vertical Alignment and Horizontal Stitching are not performed on 1-Camera scanners.
** Color Calibration is performed on color scanners only.

The SM Calibration Sheets are shown on:

Fig. 5-1, SM Calibration Sheet, 25” .....page 92
Fig. 5-2, SM Calibration Sheet, 36/40/42" .....page 93
Fig. 5-3, SM Calibration Sheet, 54” .....page 94

To avoid vertical lines in the scanned image, the Glass Plate and the White Background Plate must be thoroughly cleaned before running Scanner Maintenance, see SCANtest 6, Test 20, Noise Test on page 99.

Procedure:

Start Scanner Maintenance

Insert SM Calibration Sheet

Follow the instructions given on the screen.

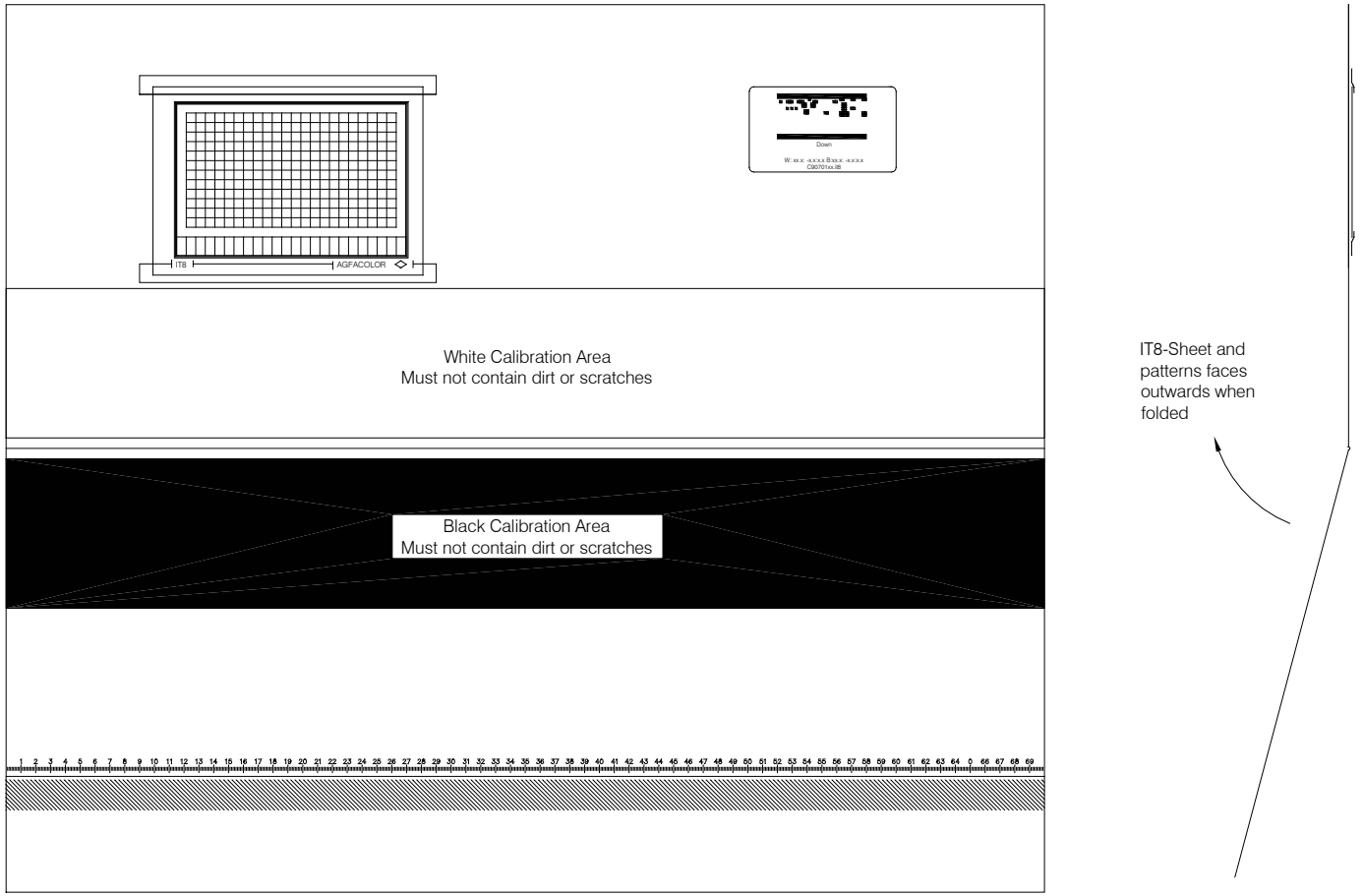


Fig. 5-1, SM Calibration Sheet, 25”

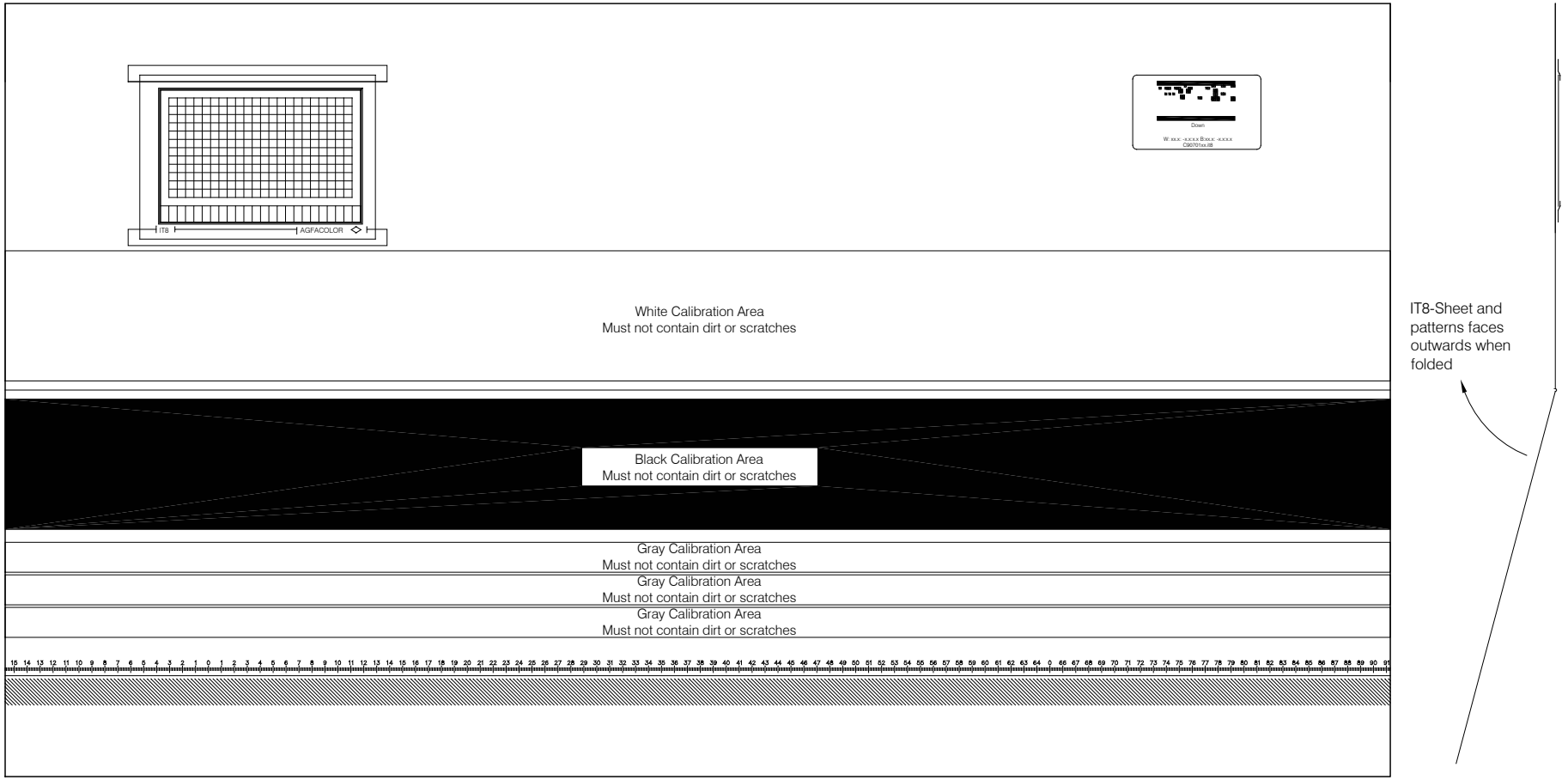

IT8
AGFACOLOR
White Calibration Area
Must not contain dirt or scratches
Black Calibration Area
Must not contain dirt or scratches
Gray Calibration Area
Must not contain dirt or scratches
Gray Calibration Area
Must not contain dirt or scratches
Gray Calibration Area
Must not contain dirt or scratches
IT8-Sheet and patterns faces outwards when folded

Fig. 5-2, SM Calibration Sheet, 36/40/42"

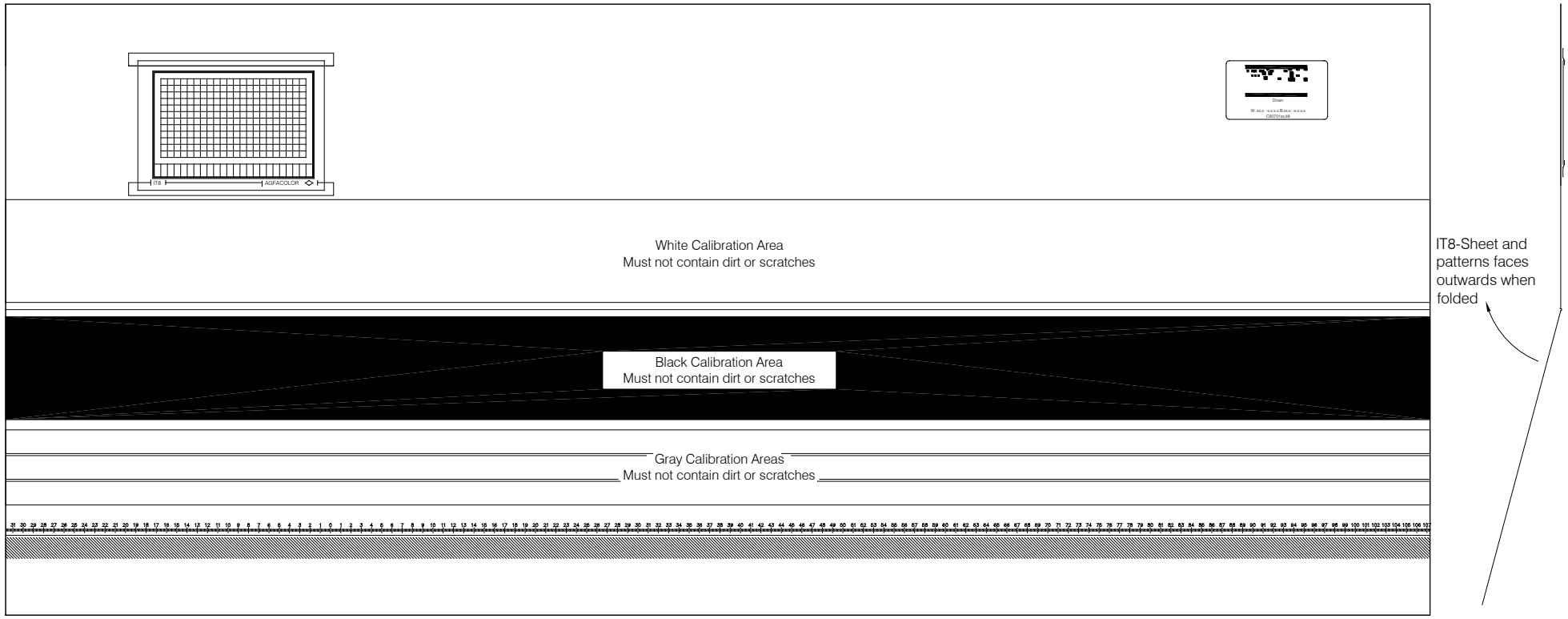

White Calibration Area
Must not contain dirt or scratches
Black Calibration Area
Must not contain dirt or scratches
Gray Calibration Areas
Must not contain dirt or scratches
IT8-Sheet and patterns faces outwards when folded

Fig. 5-3, SM Calibration Sheet, 54”

6. SCANtest

The purpose of the scanner test program, SCANtest, is to support troubleshooting and adjustment.

When SCANtest has been started, the scanner is switched into Test Mode, and the Diagnostics LED on the Operators Panel will turn on. On scanners with LED display this will read "Test Mode".

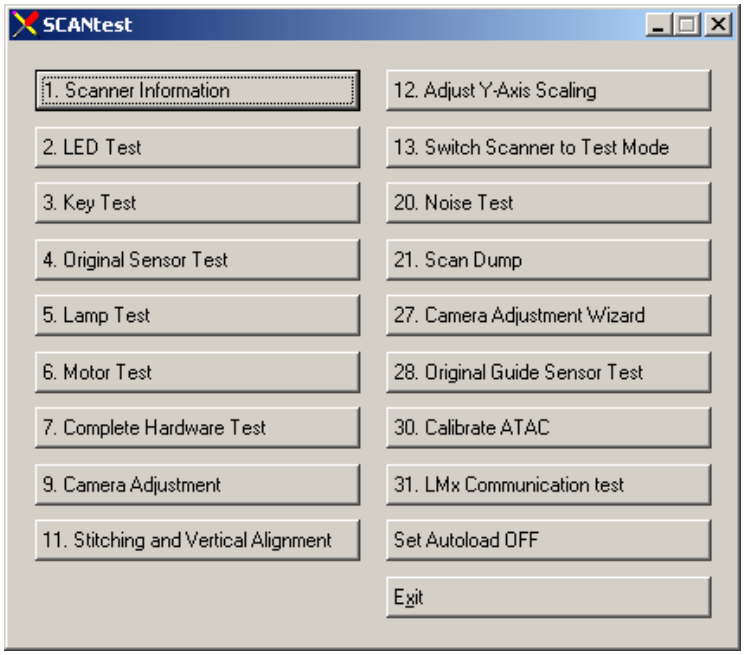


Fig. 6-1, Scanner Test Program Menu

Test 1:	Scanner Information
Test 2:	LED Test
Test 3:	Key Test
Test 4:	Original Sensor Test
Test 5:	Lamp Test
Test 6:	Motor Test
Test 7:	Complete Hardware Test
Test 9:	Camera Adjustment
Test 11:	Stitching and Vrtical Alignment
Test 12:	Adjust Y-Axis Scaling
Test 13:	Switch Scanner to Test Mode
Test 20:	Noise Test
Test 21:	Scan Dump
Test 27:	Camera Adjustment Wizard
Test 28:	Original Guide Sensor Test
Test 30:	Calibrate ATAC
Test 31:	LMx Communication Test

If SCANtest is started when the scanner is in Error Mode, the Error Code Number and a short description of the error will be displayed on the screen.

6.1 Test 1, Scanner Information

Purpose: This test displays various scanner data and allows for changing one or more of the following:

Change Serial Number
Reset Lamp Counter
Setting OEM *

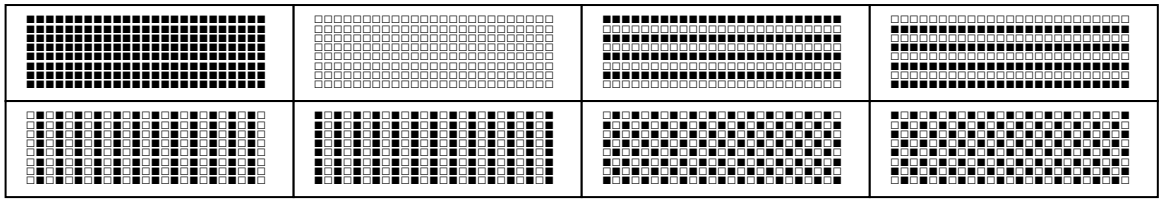
* Password for reset of counter is “xetnoc”

6.2 Test 2, LED and LCD Display Test

6.2.1 Scanners with LED Display

Purpose: To test the LED Indicators and LCD Display on the Operator Panel.
Description: Until Test 2 is terminated the following is performed:

- All LEDs are sequentially switched ON/OFF. The ATAC LED will display 3 different colors (red, green , yellow sequentially)
- Eight patterns will be shown one after the other on the LCD display. Check that all eight patterns are right and that no pixel is wrong.
  The patterns looks like this (■: black pixel, □ white pixel):



6.2.2 Scanners without LED Display

Purpose: To test the LED Indicators on the Operator Panel.
Description:
All LEDs are sequentially switched ON/OFF until Test 2 is terminated.

6.3 Test 3, Key Test

6.3.1 Scanners with LED Display

Purpose: To test the Keys on the Operator Panel.
Description: Press all keys, one at a time, and check that the three LED's (FAST/NORMAL/BEST) turns on whenever a key is pushed. Furthermore, the first line of the display shows the hexadecimal ID-number of the key when it is pushed. The second line of the display shows all the pushed keys ID-numbers logically OR’ed together. When all keys have been pushed a star (*) will be shown to the right of the second line.

```
Current: 000000
Tested:  03FFFF*
```

6.3.2 Scanners without LED Display

Purpose: To test the Keys on the Operator Panel.
Description
Each key on the Operator Panel will turn a LED ON when pressed.

Key	LED
Forward and Reverse	Ready (Green)
Appl. (E-mail, Scan, and Copy)	Wait
Power	Wait
ATAC	Ready (Green)

6.4 Test 4, Original Sensor Test

6.4.1 Scanners with LED Display

Purpose: To test the Original Sensors .
Description: When the test is started the display will look like this:

```
Test mode
input:0 output:0
```

Insert a piece of paper and feed it using the Forward Key. The table below shows how to verify that an activated sensor is recognized by the scanner:

Sensor	Display Status when Activated	LED Status when Activated
Entry/Input	"input:" changes to "1"	FAST LED is switched on
Exit/Output	"output:" changes to "1"	BEST LED is switched on

6.4.2 Scanners without LED Display

Purpose: To test the Original Sensors and the Media Thickness Detector.
Description:
The following LEDs turn ON when one of the Original-Sensors is activated, or when one or both Adjustment Sliders for Media Thickness are pulled out from Normal position:

Actuator	LED
Original Entry Sensor	Ready (Green)
Original Exit Sensor	Ready (Green)
Adjustment Slider for Media Thickness	Wait

6.5 Test 5, Lamp Test

Purpose: To test the Lamp and associated electronics.
Description: A message on the screen will inform whether the **Lamp** is turned ON or OFF (Lamp power is turned ON/OFF) and whether the **Light** is ON/OFF (Light is detected or not).
The Lamp is delayed approx. 2 seconds when switched ON.

6.6 Test 6, Motor Test

Purpose: To test the Stepper Motor and associated electronics.
Description: From the menu the motor speed and the direction of rotation can be selected.

6.7 Test 7, Complete Hardware Test

Purpose: To test various functions on the SUx and CBx boards.

6.8 Test 9, Camera Adjustment

See also Test 27, Camera Adjustment Wizard
Purpose: To support CCD-Camera evaluation and adjustments.
Description: Test 9 contains a "Software Oscilloscope" for check and adjustment of the cameras. The following functions can be selected from the Test Program Menu.

- Uncorrected or Corrected Light Profile
- Red, Green, Blue, or Gray Color Channel (Selections depend on scanner model)
- Special Detail Views for Light Profile, Scan Width, and Vertical Positioning
- Forward / Reverse controls for the Camera Motor
- Save screen images
- Print screen images
- Load saved images
- Camera adjustment using the SCA tool (lower left detail window), see Appendix 1, Camera Adjustment using the SCA Tool

The contents of Detail Views are marked on the upper overview window by red vertical lines. The continuous lines refer to the left Detail View and the dashed lines to the right Detail View.

Note: The horizontal lines represent 20 graytone values

6.9 Test 11, Stitching and Vertical Alignment

Purpose: Performs Automatic Vertical Alignment and Horizontal Stitching.
Description: After Test 11 has been started:

- Insert SM Calibration Sheet
- Select Vertical Alignment to align the cameras
- Select Horizontal Stitching to stitch the cameras

The screen image may be saved or printed.

Test 11 allows manual setting of the Stitch Values. The Stitch Values are stored in the Flash Memory on the SUx board.
The Vertical Alignment may be adjusted manually by controlling the Camera Motor from the control field

The two buttons marked "<<" respectively ">>" are used to start the motor and to determine the direction of rotation. When stated, the motor runs for dddd mili-seconds as entered into the control field.

6.10 Test 12, Adjustment of Y-Axis Scaling

Purpose: To adjust the Y-Axis Scaling.
Description: The scaling (dpi) in the mechanical scan direction (Y-Axis) depends on the speed of the stepper motor relative to the scanline Exposure Time. The default motor speed can be changed ± 1%, either from Test 12 or by using the '*Scanner Setup/Correction factor …*' option of WIDEimage.
The correction factor is stored in the Flash Memory on the SUx Board.

6.11 Test 13, Switch Scanner to Test Mode

Purpose: To switch the scanner back to Test Mode. Useful if the scanner gets out of Test Mode, e.g. if it has to be turned OFF/ON during troubleshooting.

6.12 Test 20, Noise Test

Purpose: To detect and locate the possible cause (dust, dirt, scratches,..) of vertical lines running from top to bottom of the scanned image.
Description: Test 20 scans the White Calibration Area of the SM Calibration Sheet and displays, for each color channel, the graytone values of each separate pixel averaged over the scanned band.
The displayed image of the SM Calibration Sheet will be superimposed by low level noise caused by the CCD chip, and larger spikes most likely caused by dust, dirt, scratches, or similar defects on the Glass Plate. In rare cases, larger spikes may be caused by dust, dirt, or pixel faults on the CCD chip.

The positions of larger spikes are shown by the numbers (cm or inch units) opposite to the spikes. The numbers refer to the Sideload-ruler on the scanner.

- **Downward spikes** often show up as darker vertical lines in the scanned image, see Fig. 6-2. Larger spikes are often caused by dust, dirt, scratches, or similar defects on the Glass Plate and may be remove by cleaning the Glass Plate.
- **Upward spikes** show up as very bright vertical lines in the scanned image, see Fig. 6-2. Larger spikes are often caused by dust or dirt present on the Glass Plate during the last calibration with Scanner Maintenance. These defects are memorized by the Light Profiles stored in Flash Memory and can only be removed by cleaning of the Glass Plate followed by running Scanner Maintenance again.

White vertical lines in the scanned image may be found even if Noise Test shows a perfectly ‘clean’ scanner. In this case, the cause may be white dust or particles on the backside of the Glass Plate having the same color as the white background.
In this case, the Light Profiles of Test 9 may show upwards going spikes when a dark original is placed in the scan-area.

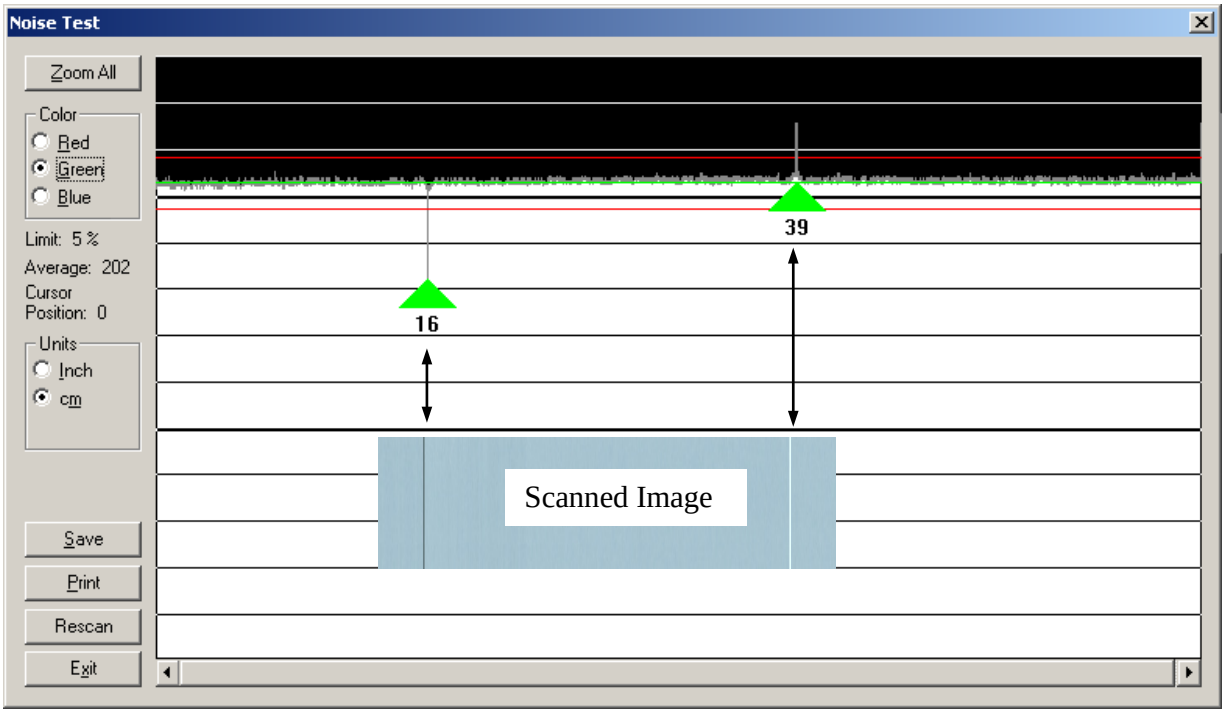


Fig. 6-2, Noise Test, Example

6.13 Test 21, SCANdump

Purpose: To create a file, SCANdump.con, which contains Light Profiles and other scanner data for diagnostics purposes.
Description: The file SCANdump.con will be placed in the directory pointed to by the SET TEMP environment variable.
The files contained in SCANdump.con may be unpacked by SCANview by double clicking on SCANdump.con.
The unpacked Light Profiles may be viewed by SCANview. If other files are included use an appropriate reader or viewer.

6.14 Test 27, Camera Adjustment Wizard

See also Test 9, Camera Adjustment
Purpose: To support CCD-Camera adjustments.
Description: The Camera Wizard provides a guide for a complete adjustment of all cameras of the actual scanner, just start Test 27 and follow the instructions given by the Wizard.

6.15 Test 28, Original Guide Sensor Test (all except KL67E)

Purpose: To support check and adjustment of the sensors located in the Original Guide with ATAC.
Description: see Section 3.20, page 52.

6.16 Test 30, Calibrate ATAC (all except KL67E)

Purpose: To set the current level at which the ATAC will stop if something is preventing the guide plate from moving.
To calibrate the ATAC simply run Test 30. If the calibration fails this is most likely because the tacho sensor is not functioning. In this case please refer to FSG/TSB/003 which describes how to correct this problem.

6.17 Test 31, LMx Communication Test (all except KL67E)

Purpose: To check that the sensors attached to the LMx board are working.
Description: When started the status of the sensors on the LMx board will be displayed. All should have a green check-mark (✓) to their left.
Advanced testing:

1) Detach the lamp and see that "Lamp Attached" and "Light Level" changes to a red X. Attach the lamp again and see that both signals changes to a green check-mark (✓)
2) Detach connector J4 on the LMx board (protective cover must be removed, ***pay attention to high voltage area***, see Fig. 3-2 page 23 and see that the "Light Level" changes to a red X
   Connect J4 again and see that "Light Level" changes to a green check-mark (✓)
3) Stop Fan 4* and see that "Fan 4" changes to a red X
4) Stop Fan 3* and see that "Fan 3" changes to a red X

* If the fans do not start automatically after unblocking them the scanner must be rebooted to start them again.

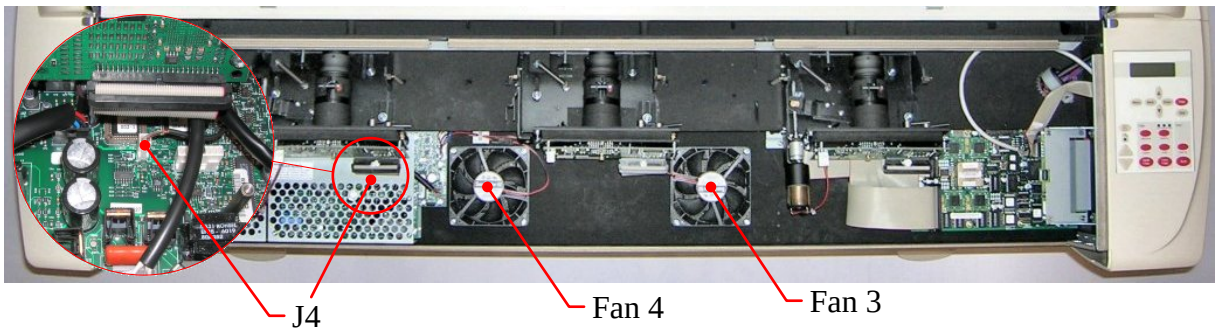


Fig. 6-3, Fans and Lamp Feed-Back

7. Special Service Tools

Adjustment Patterns and tools	**Part Number**	**KA67E KH67E KK67E** (3C36")	**KC67E KE67E KF67E KM67E** (4C42")	**KD67E KN67E** (4C54")	**KL67E** (1C25")
Optical Adjustment Pattern, 1C25”	6779D105R01				x
Optical Adjustment Pattern, 3C36”	6779D138R01	x			
Optical Adjustment Pattern, 4C42”	6779D144R01		x		
Optical Adjustment Pattern, 4C54”	6779D130R01			x	
Focus Pattern, 25”	6779D215R01				x
Focus Pattern, 54”	6779D228R01			x	
Focus Pattern, 40/42”	6779D216R01	x	x		
SM Calibration Sheet, 25”	6799D115				x
SM Calibration Sheet, 42”	6799D171	x	x		
SM Calibration Sheet, 54”	6799D165			x	
Adjustment Tool for Roller Sensor	6779D133R01	x	x	x	
Adjustment Tool for Top Sensor	6779D246R01	x	x	x	

8. Wiring Diagrams

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Fig. 8-2, 3C36” Secondary Wiring (KA67E).....page 104
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Fig. 8-4, 4C42” Secondary Wiring (KC67E, KM67E).....page 106
Fig. 8-5, 3C36” Primary Wiring (KH67E, KK67E) .....page 107
Fig. 8-6, 3C36” Secondary Wiring (KH67E, KK67E) .....page 108
Fig. 8-7, 4C42” Primary Wiring (KE67E, KF67E).....page 109
Fig. 8-8, 4C42” Secondary Wiring (KE67E, KF67E).....page 110
Fig. 8-9, 4C54" Primary Wiring (KD67E, KN67E).....page 111
Fig. 8-10, 4C54" Secondary Wiring (KD67E, KN67E).....page 112
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8.1 3C36" Primary Wiring (KA67E)

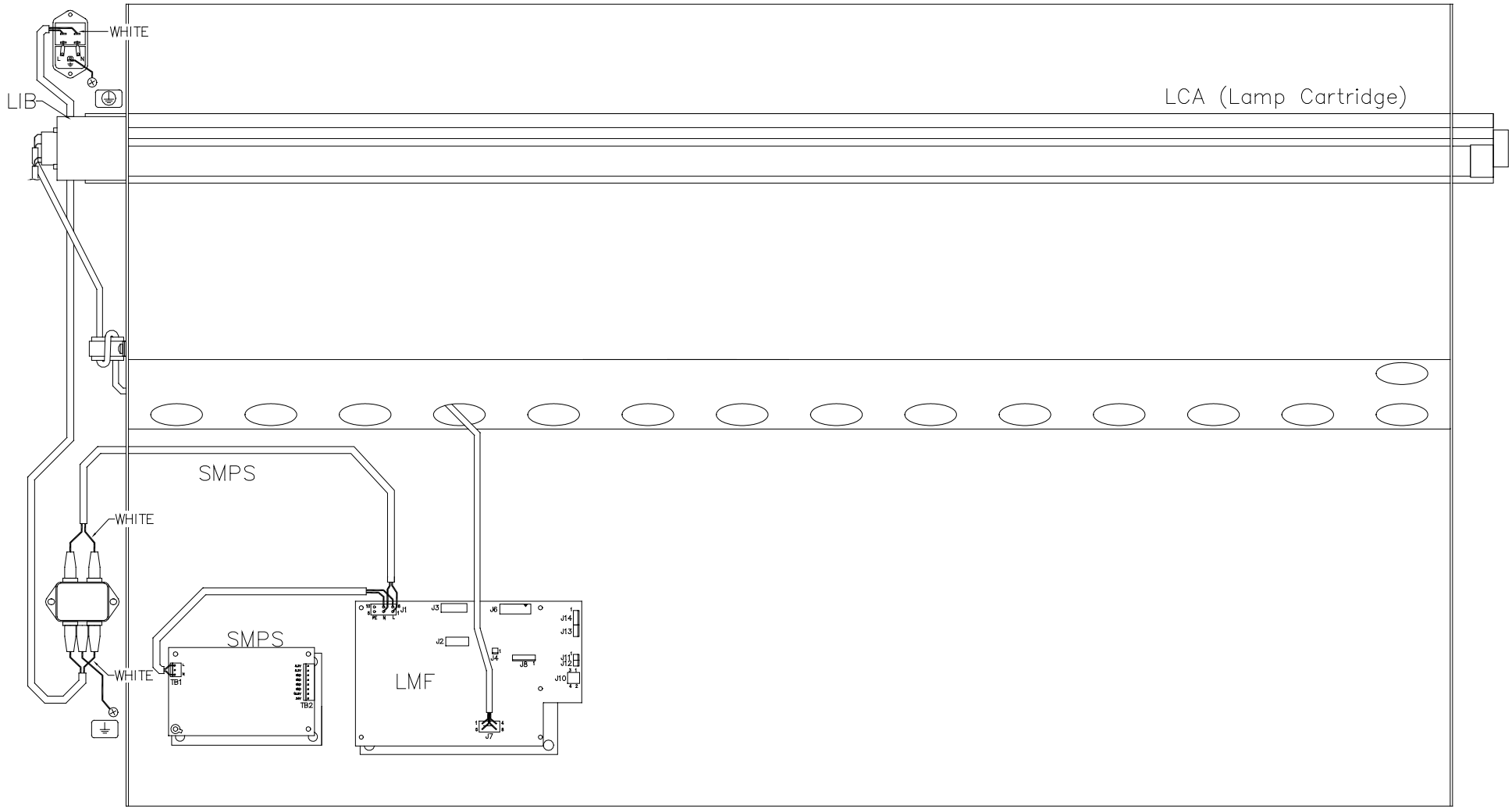


Fig. 8-1, 3C36" Primary Wiring (KA67E)

8.2 3C36" Secondary Wiring (KA67E)

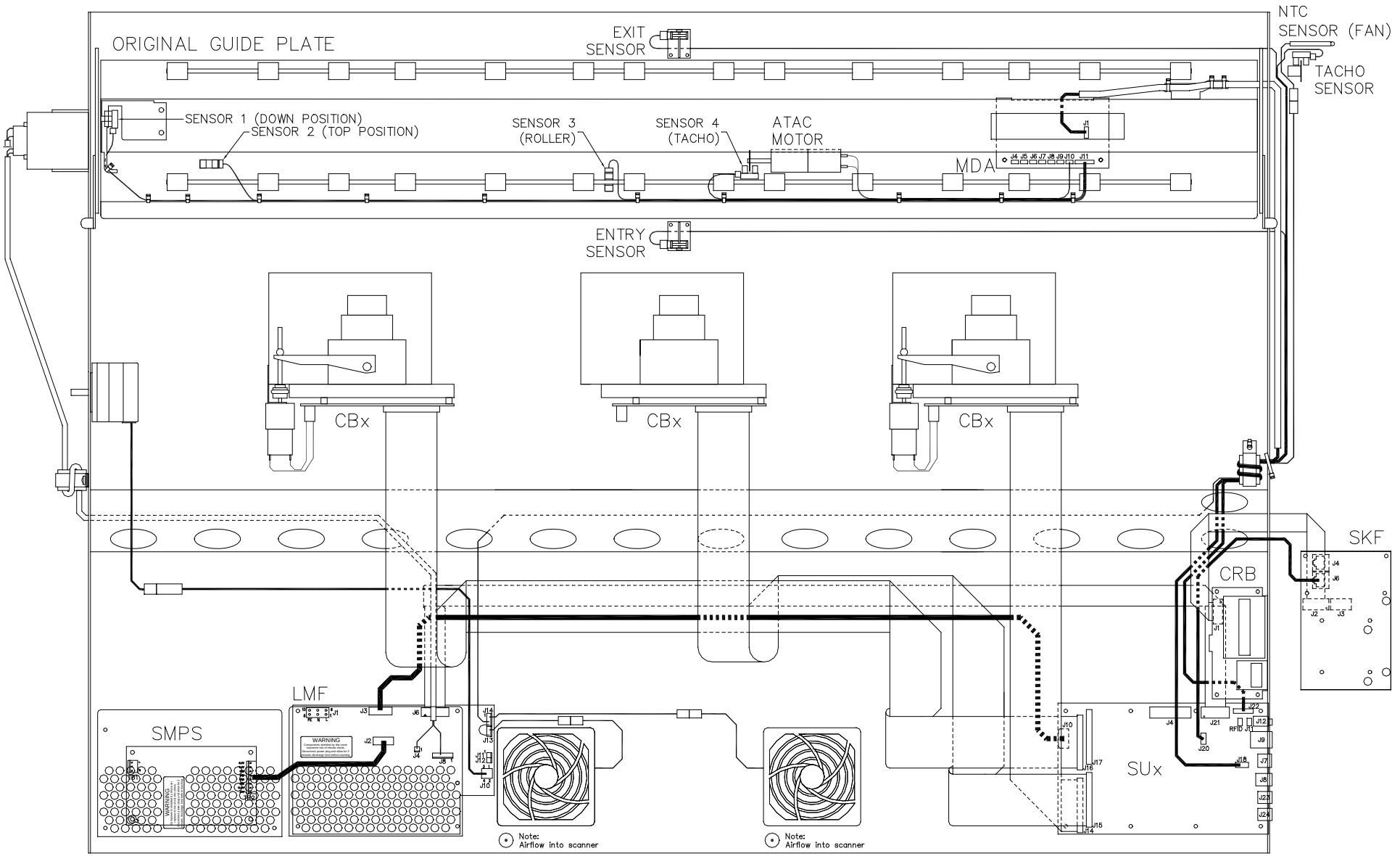


Fig. 8-2, 3C36" Secondary Wiring (KA67E)

8.3 4C42" Primary Wiring (KC67E, KM67E)

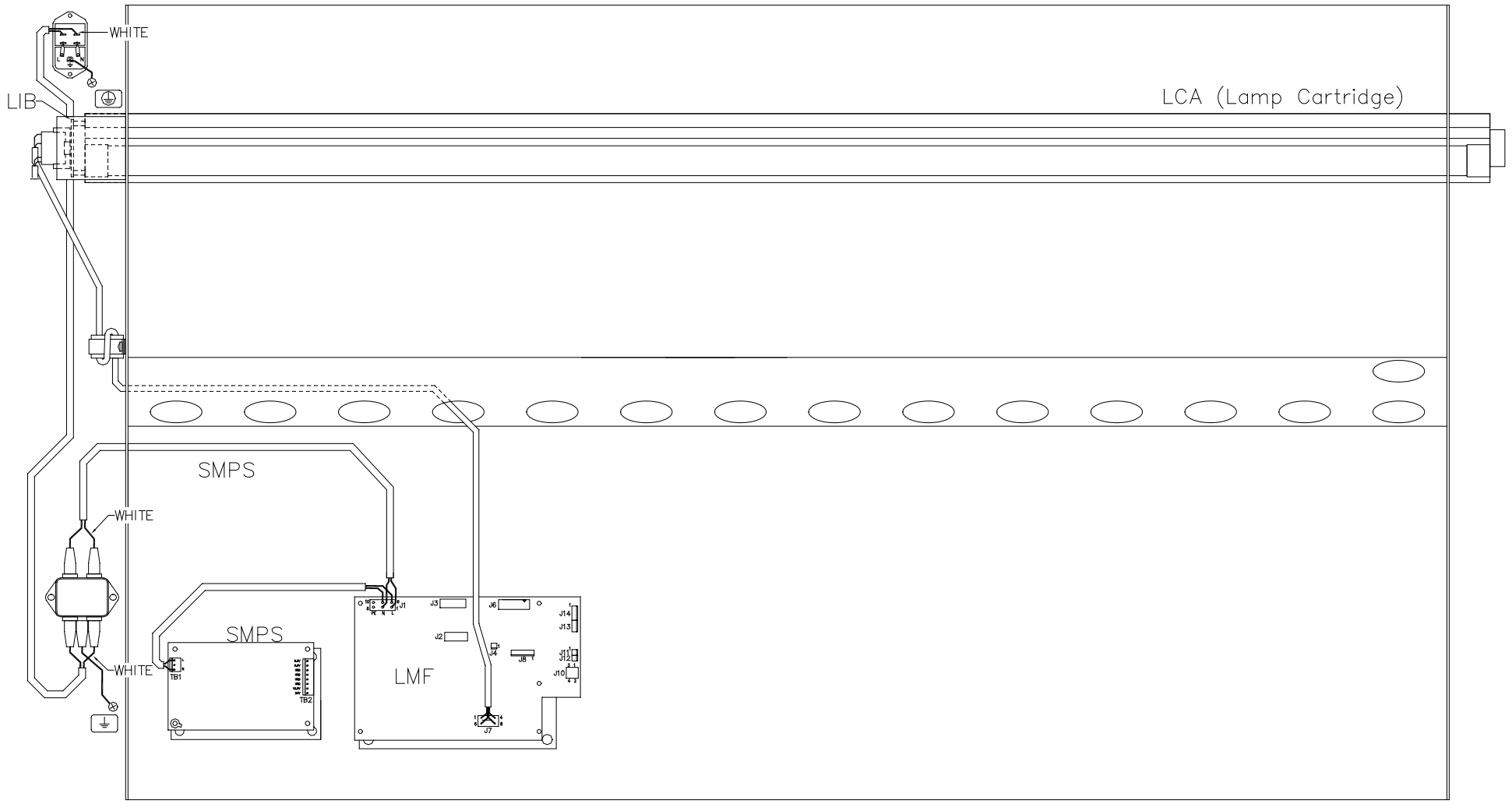


Fig. 8-3, 4C42" Primary Wiring (KC67E, KM67E)

8.4 4C42" Secondary Wiring (KC67E, KM67E)

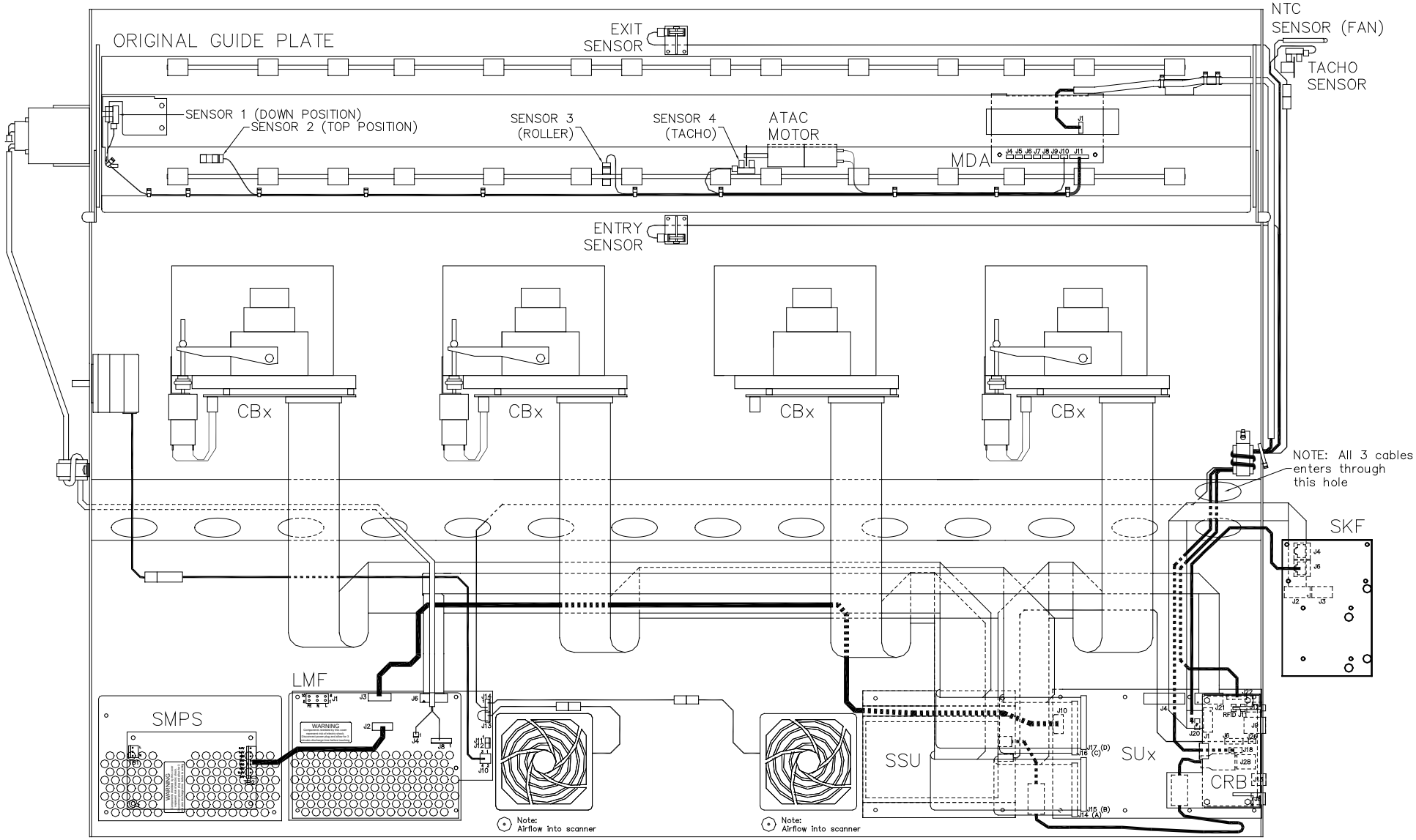


Fig. 8-4, 4C42" Secondary Wiring (KC67E, KM67E)

8.5 3C36" Primary Wiring (KH67E, KK67E)

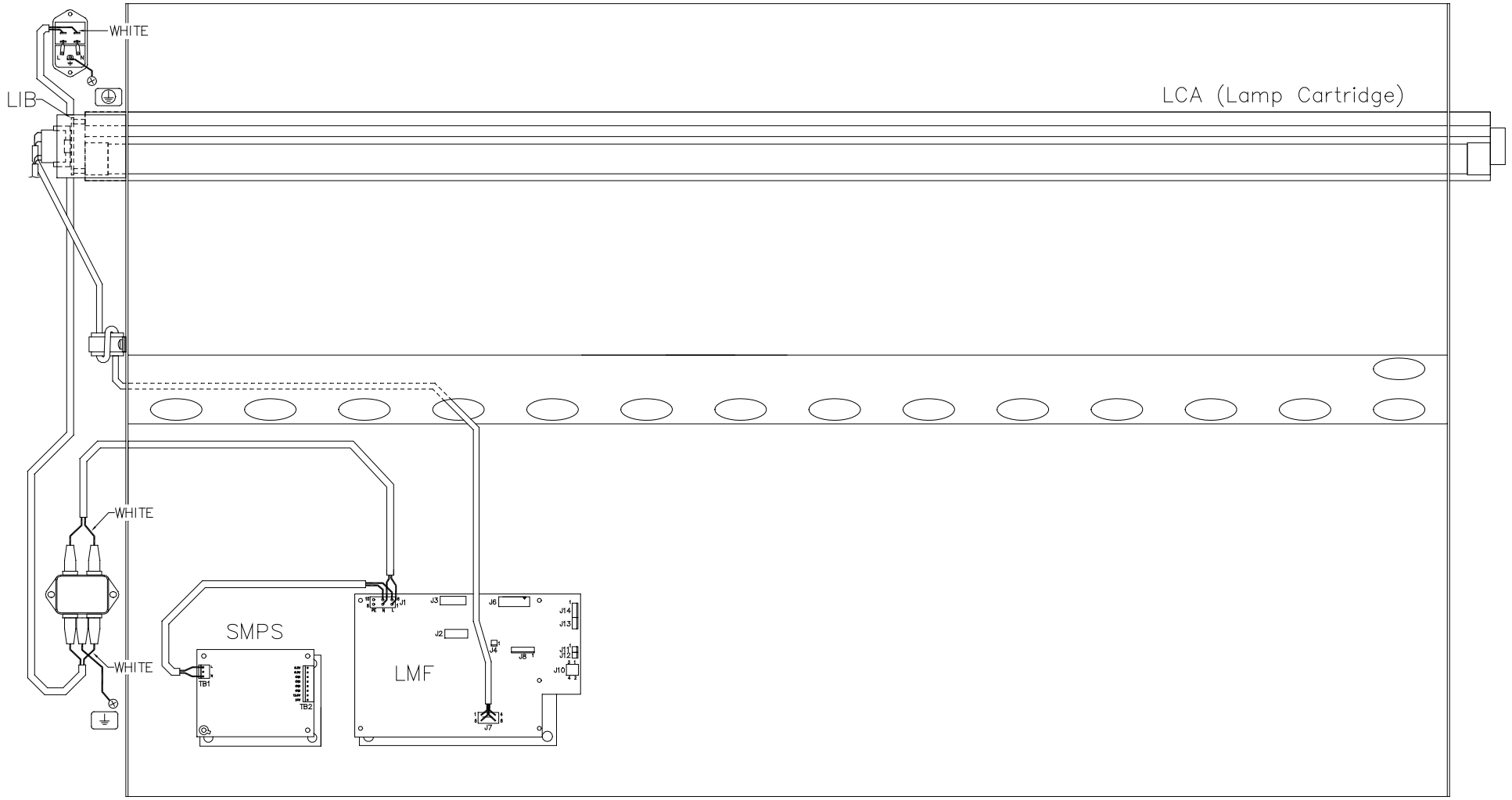


Fig. 8-5, 3C36" Primary Wiring (KH67E, KK67E)

8.6 3C36" Secondary Wiring (KH67E, KK67E)

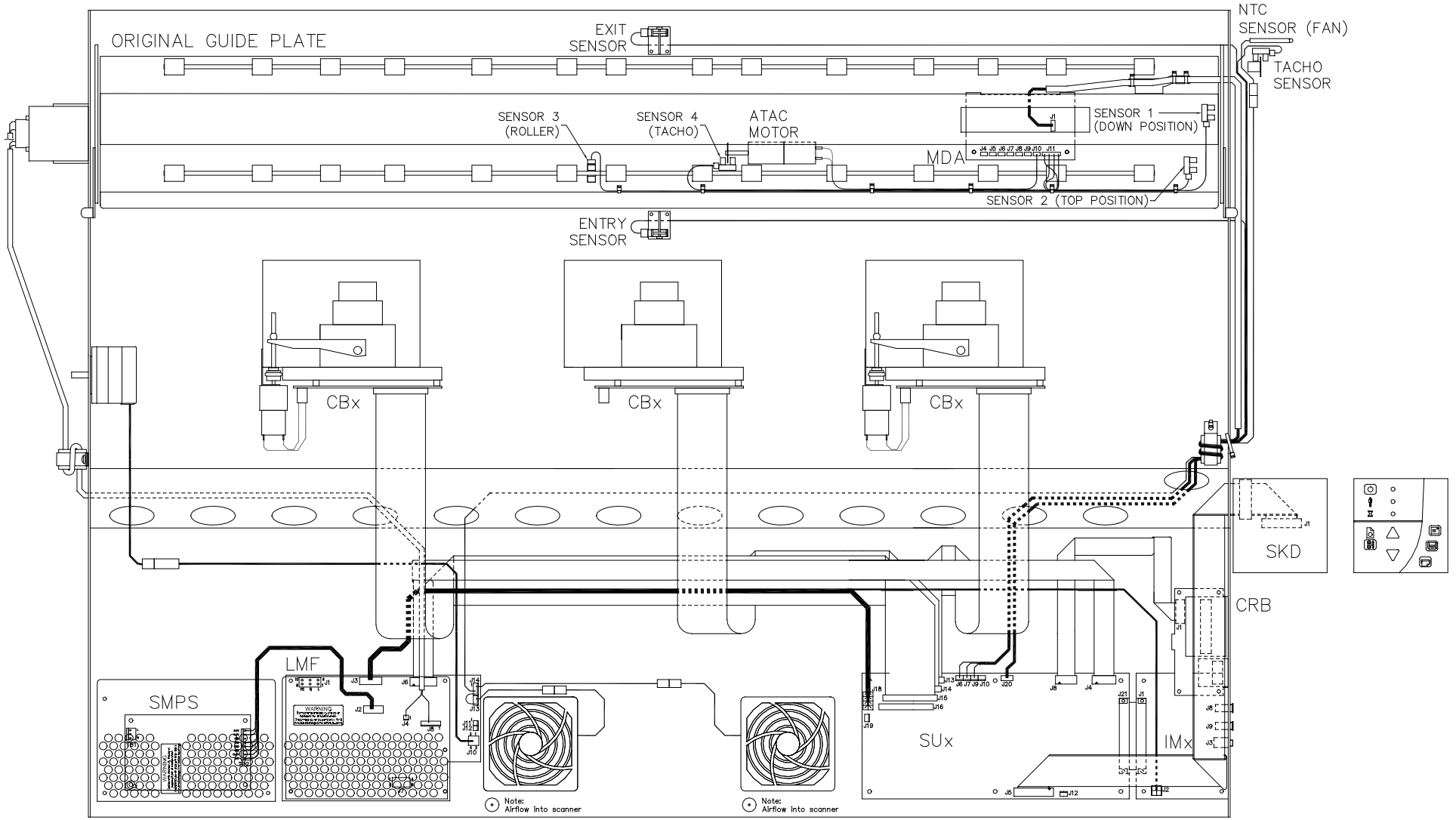


Fig. 8-6, 3C36" Secondary Wiring (KH67E, KK67E)

8.7 4C42" Primary Wiring (KE67E, KF67E)

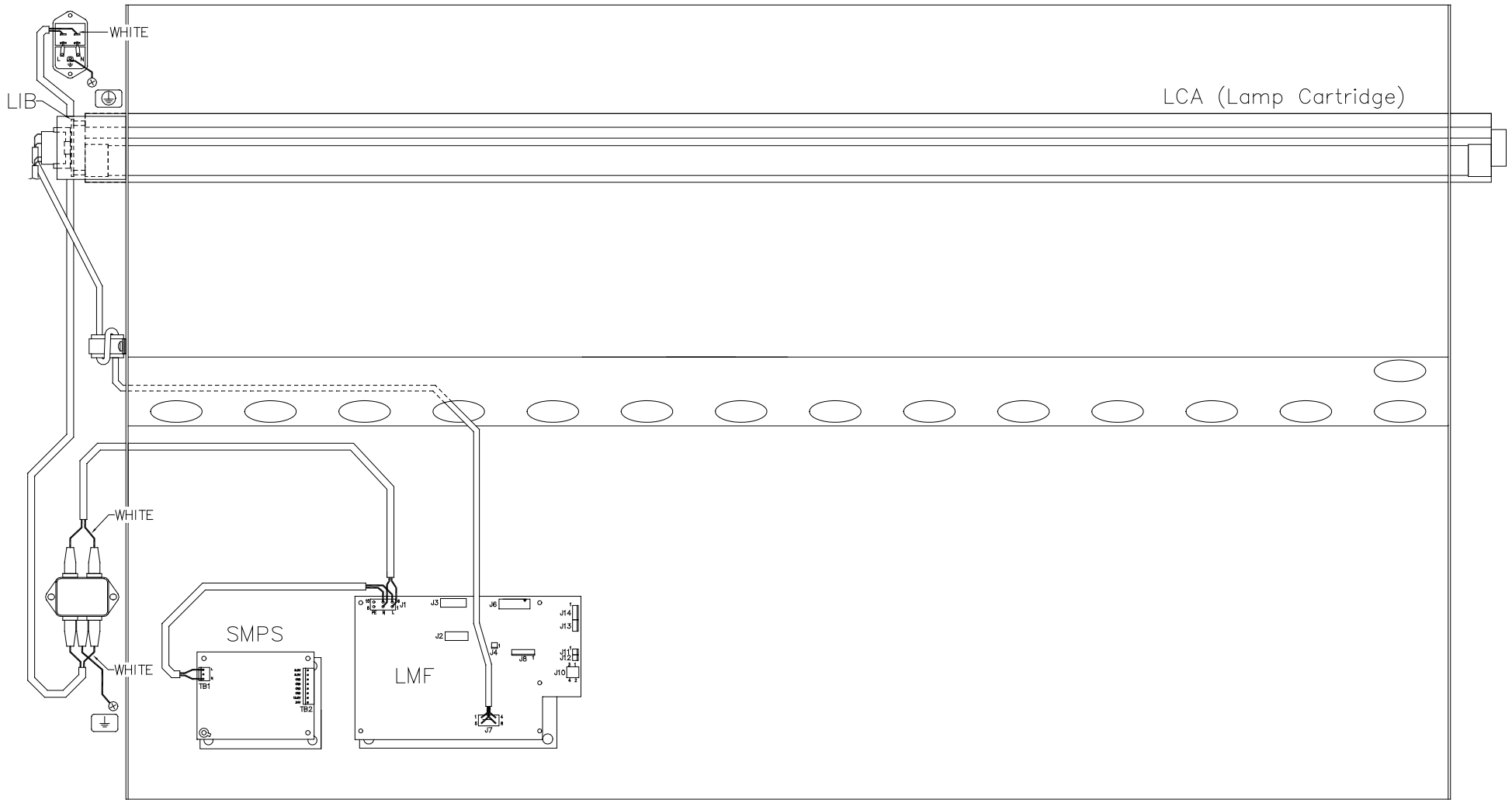


Fig. 8-7, 4C42" Primary Wiring (KE67E, KF67E)

8.8 4C42" Secondary Wiring (KE67E, KF67E)

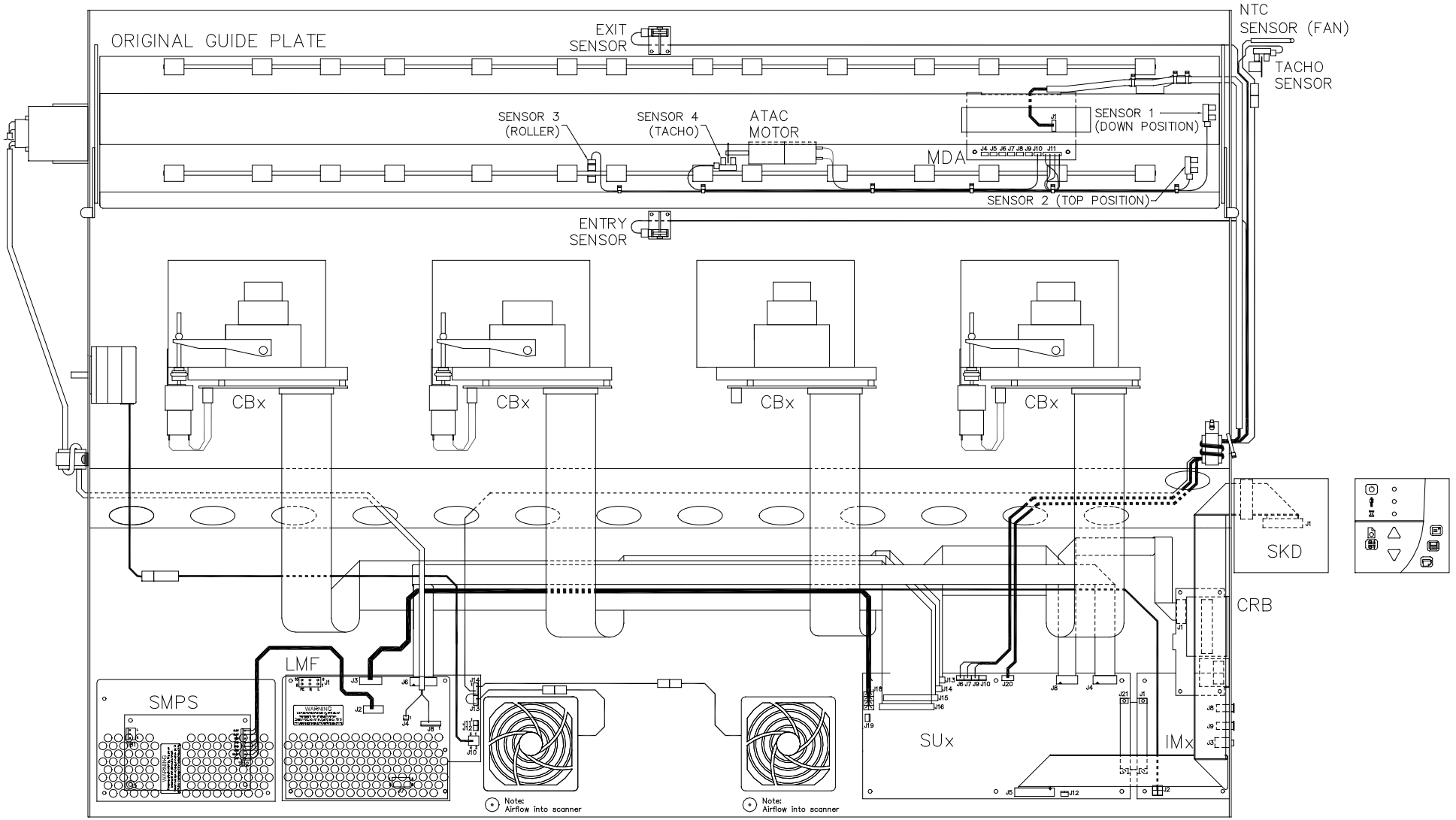


Fig. 8-8, 4C42" Secondary Wiring (KE67E, KF67E)

8.9 4C54" Primary Wiring (KD67E, KN67E)

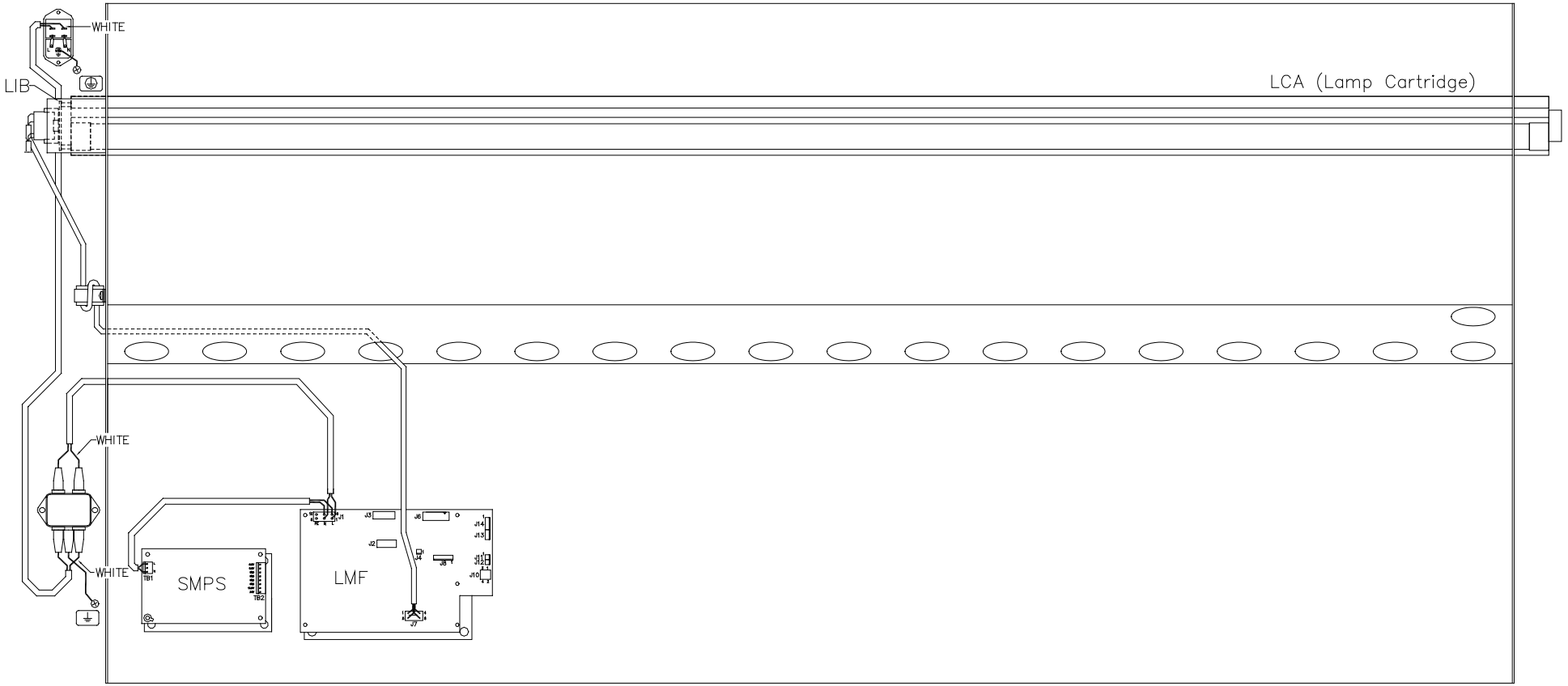


Fig. 8-9, 4C54" Primary Wiring (KD67E, KN67E)

8.10 4C54" Secondary Wiring (KD67E, KN67E)

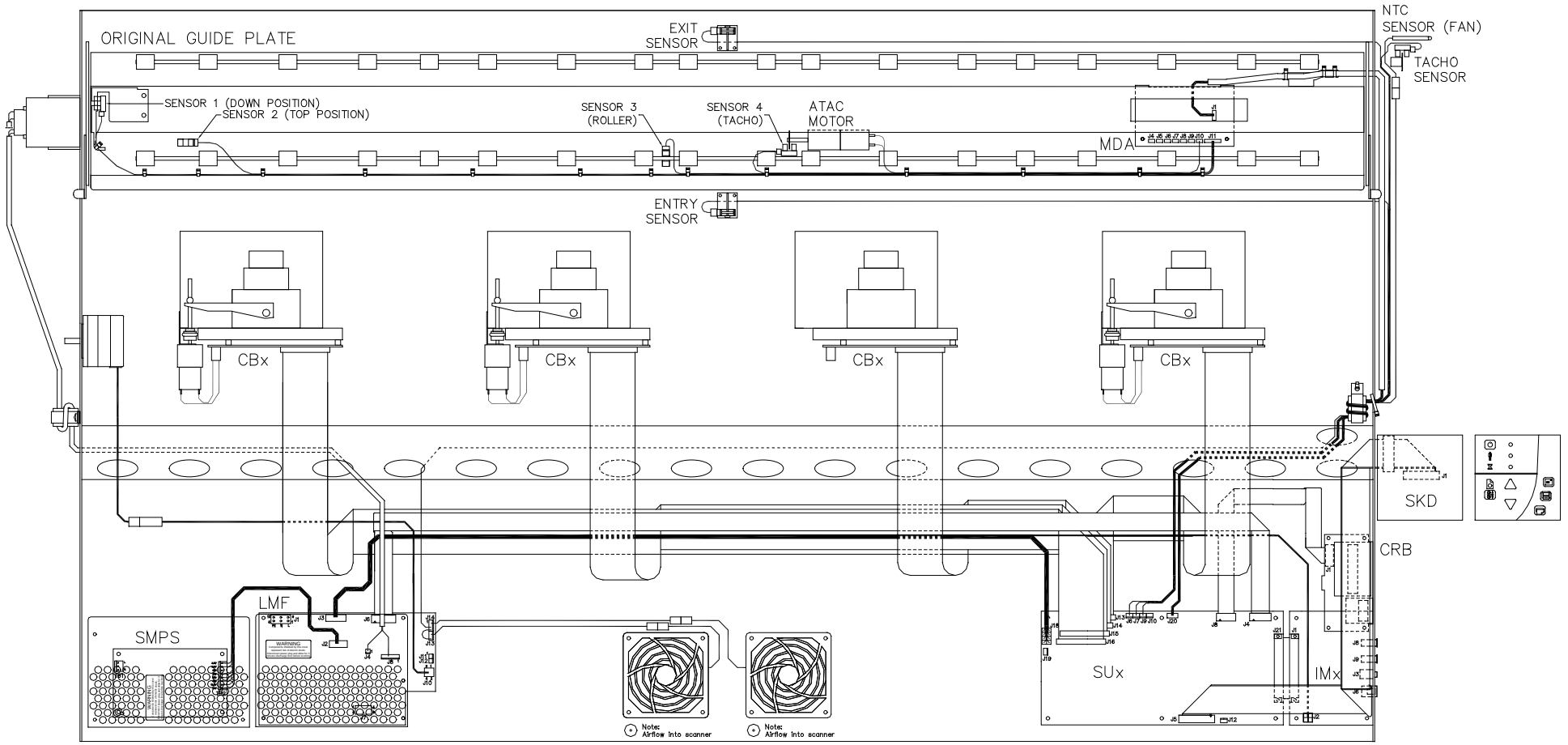


Fig. 8-10, 4C54" Secondary Wiring (KD67E, KN67E)

8.11 1C25" Primary Wiring (KL67E)

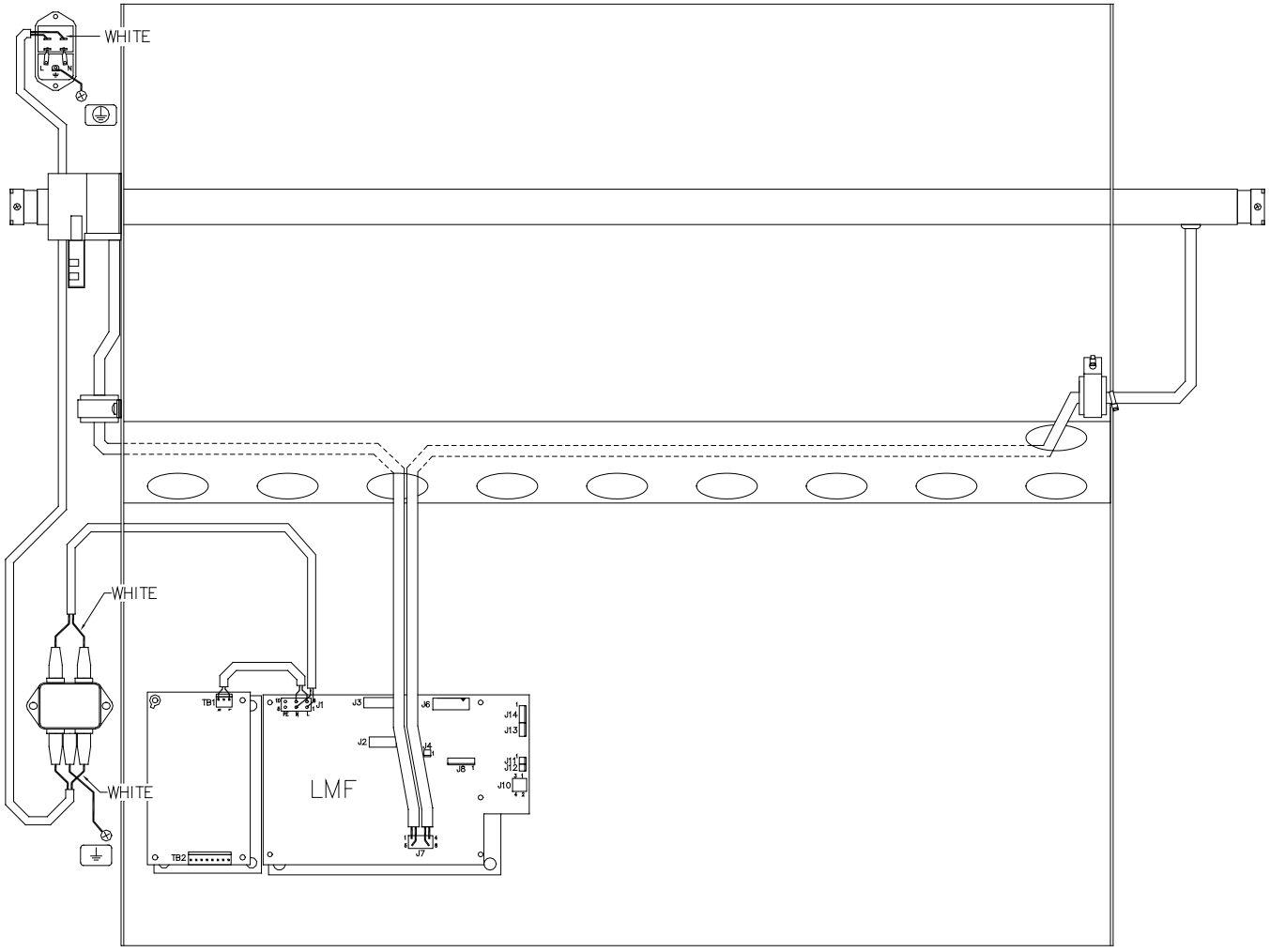


Fig. 8-11, 1C25" Primary Wiring (KL67E)

8.12 1C25" Secondary Wiring (KL67E)

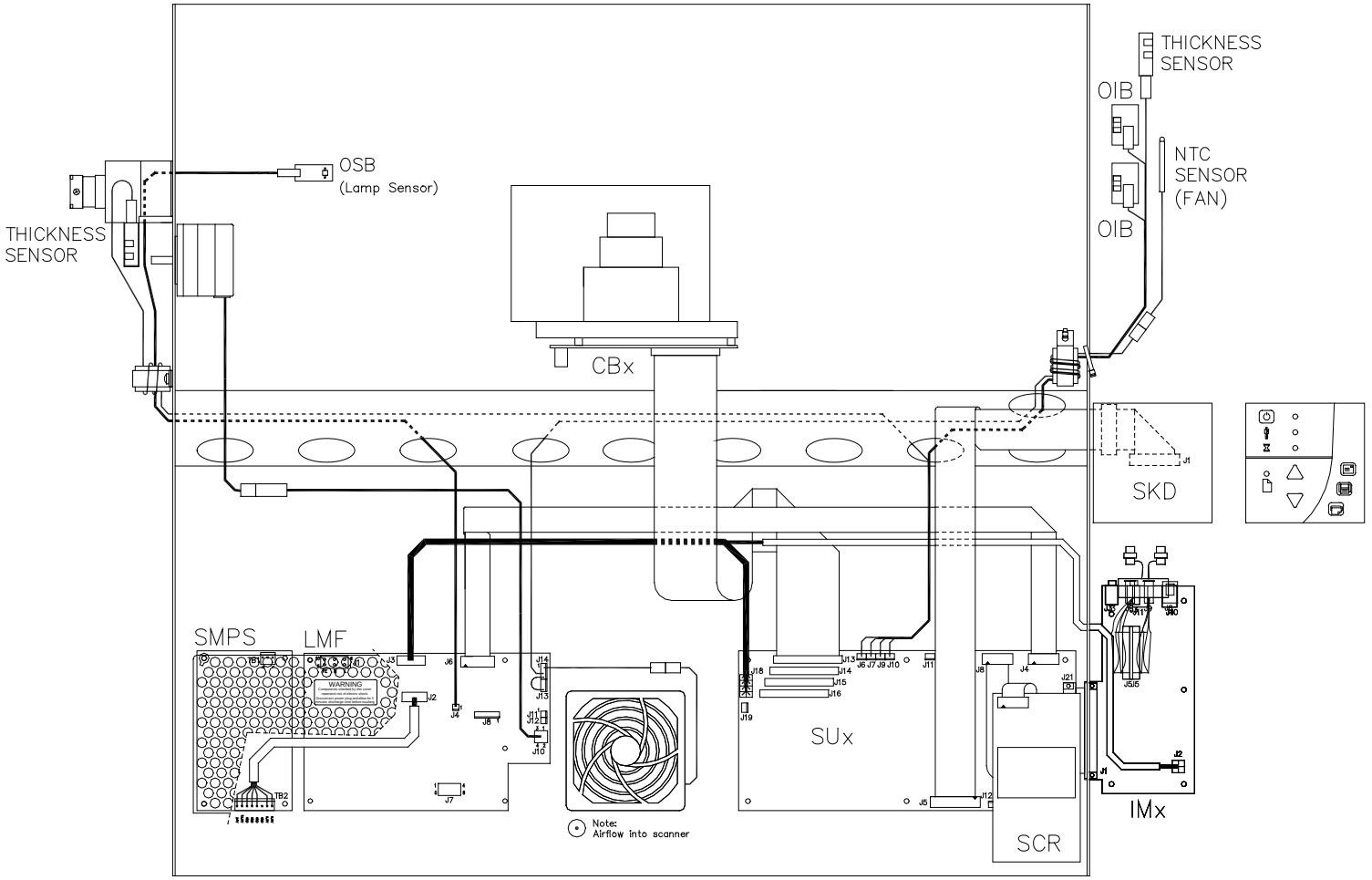


Fig. 8-12, 1C25" Secondary Wiring (KL67E)

9. Appendix 1, Camera Adjustment using the SCA Tool

The SCA (Simple Camera Adjustment) Tool can be used to make a camera adjustment which is considered to be OK in most cases. But it should be noted that it cannot replace a camera adjustment made using the Optical Adjustment Pattern, if the highest possible precision is required.
The following can be adjusted:

- VP (Vertical Position)
- Tilt
- CCD Centering

IMPORTANT: The Scan Width (horizontal scaling) cannot be adjusted. This requires the use of the Optical Adjustment Pattern.
Also, if there after replacement of a camera board and subsequent adjustment of the camera using the SCA tool, are problems with focus and/or horizontal scaling, the camera must be adjusted using the Focus Pattern and the Optical Adjustment Pattern.

9.1 Adjusting VP, Tilt and CCD Centering Using the SCA Tool

1. Remove the Glass Plate
2. Place the tools as indicated on the cardboard (and described below) and with the top edge pressed against the rear roller shield. Make sure the tool is not "tilted".
   - Outermost positions: Tool is facing feed roller (different on 36" and 42")
   - Camera Transitions: Align hole in cardboard above stitching wire

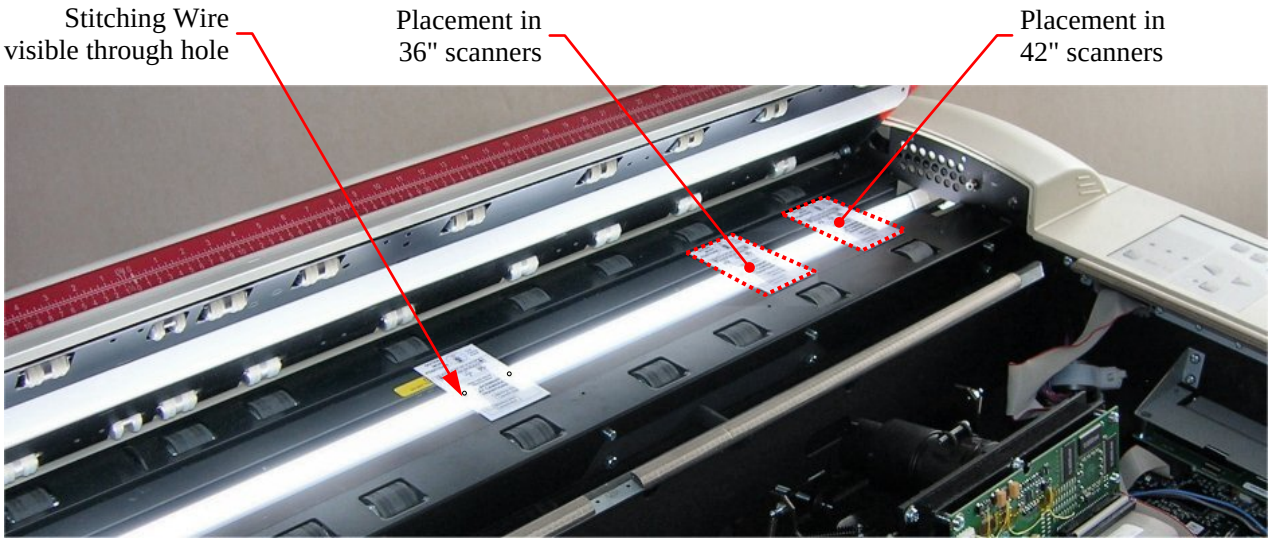


Fig. 9-1, Placing the SCA Tool

Below is shown how to place the tool in a 3 camera scanner (the red dotted lines indicate the position of the stitching wires). Note that “Camera Start” is to the right and “Camera End” is to the left!

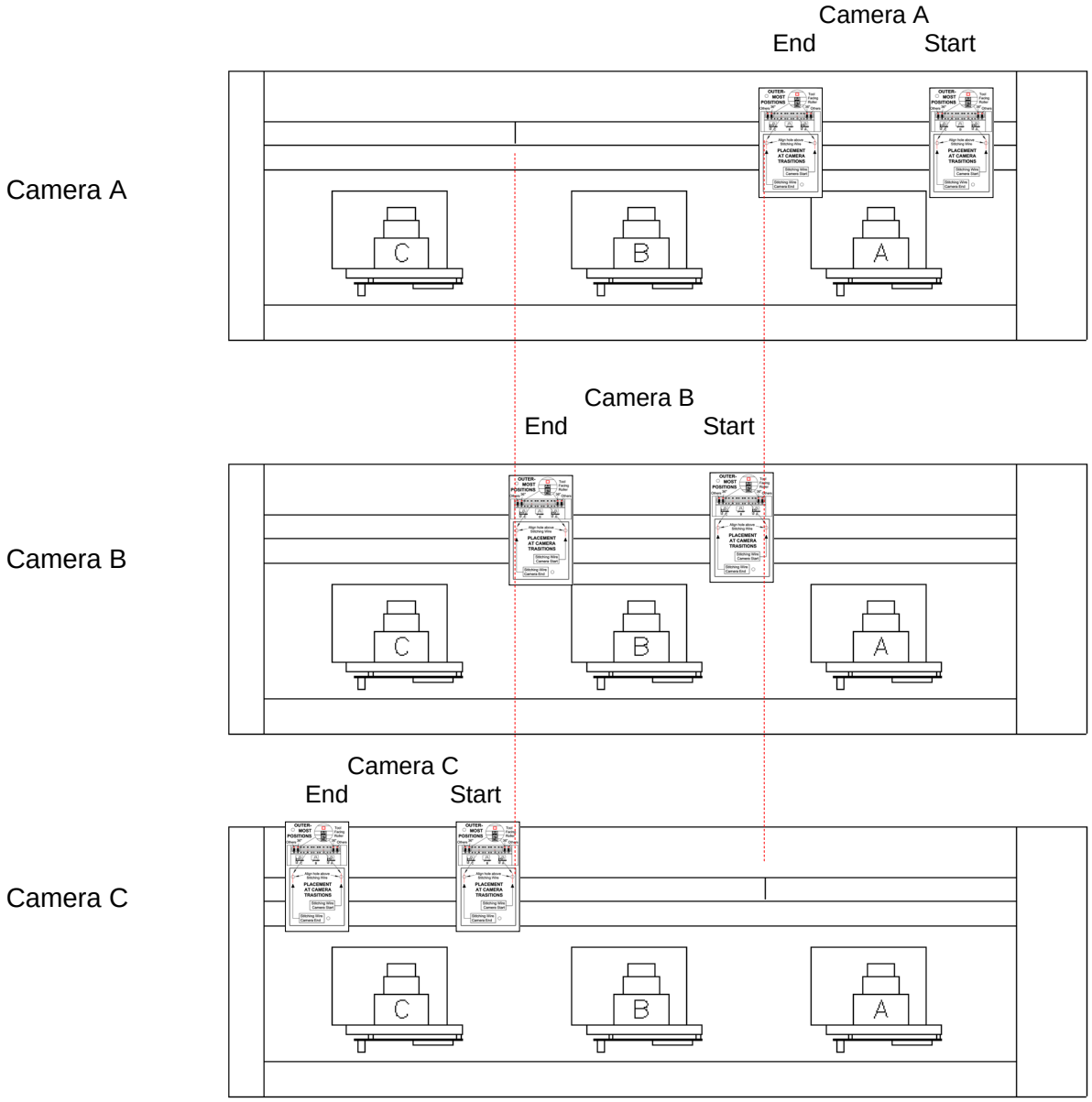
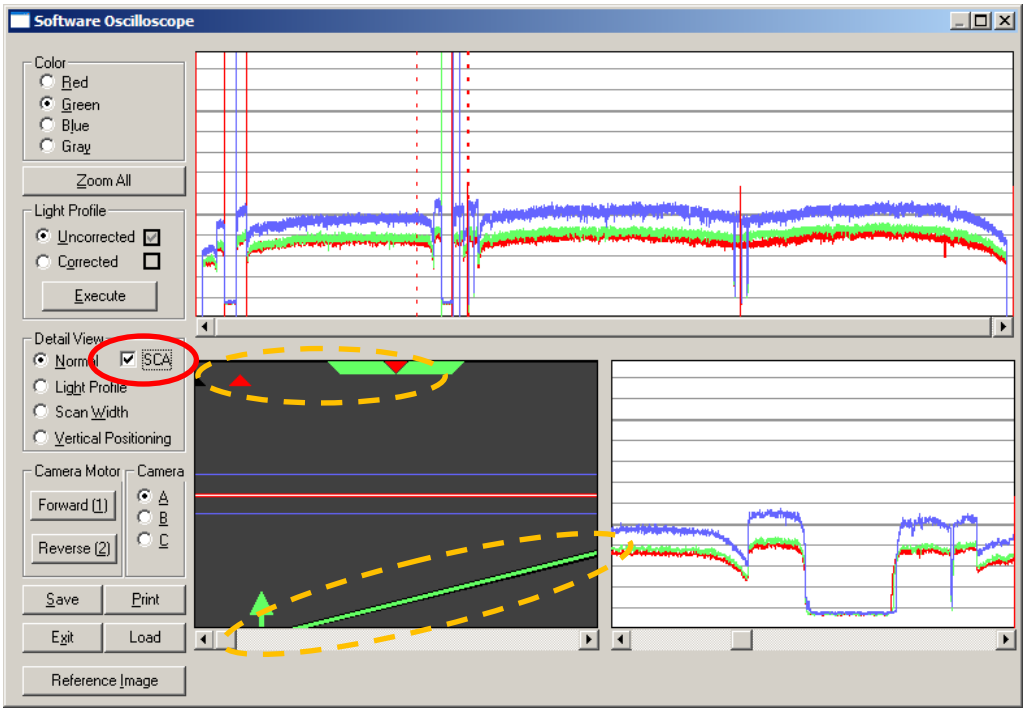


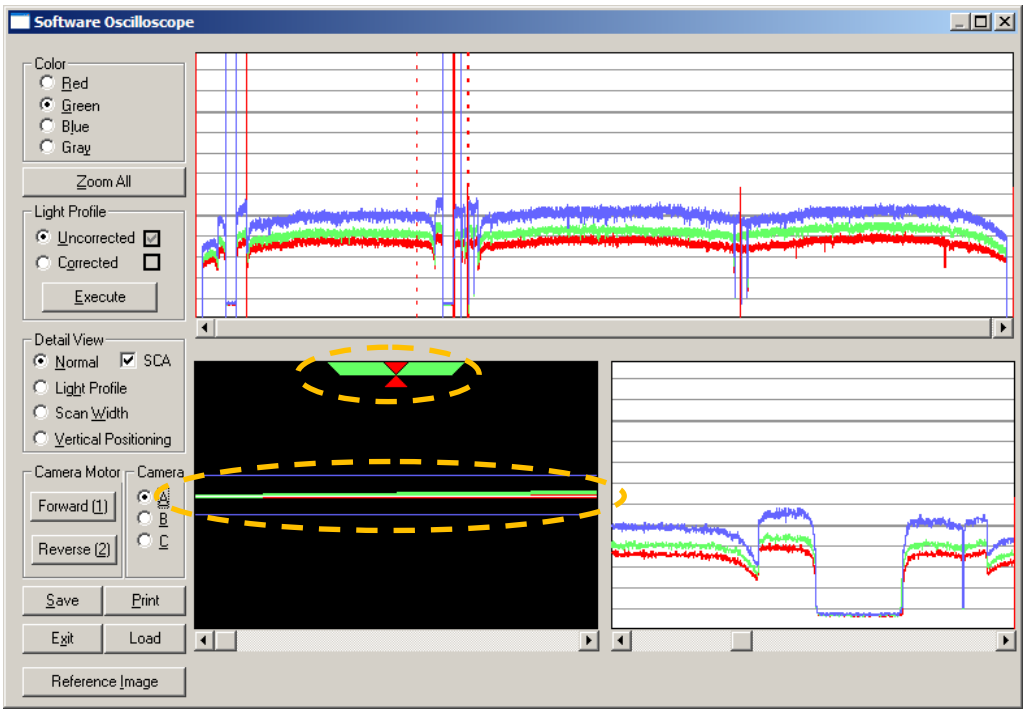
Fig. 9-2, Position of the SCA Tools in a 3 Camera Scanner

3. Close the Lid
4. Start SCANtest and select Test 9

5. Select SCA. The lower left detail window now changes like shown.



6. The aim of the adjustment is to bring the red triangles to face each other (CCD Centering) and to bring the green line on top of the red (circled with orange dotted lines) (VP and Tilt).
The adjustment is considered OK if the lower red triangle is within the green area and the green line is within the 2 blue lines.
If the green line is "outside the screen" this will be indicated with green arrows as seen in the lower left corner in the above image.
Clicking Red, Green or Blue radio button will change to classic look with only one color shown at a time.



10. Appendix 2, Error Codes

As we continuously try to improve the error system, error codes and/or corrective actions may differ from the list below. You can get the latest error list by typing **WS /errorlist** from a command prompt in the WIDEsystem install folder (C:\Program Files\Contex\WIDEsystem) or find the latest error lists on the support home page.

Please note that not all errors may apply to the actual scanner.

Error List
WIDEsystemApplication 3.4.5, Build 11561.
Mon Dec 11 11:28:55 2006

Legend
(U) = UserCorrectable
(S) = Support Correctable
(R) = R&D Correctable
(W) = Warnings

Error Code	Corrective Action	Description
Scanner API (ctx_scan_2000)		
51-1	(U)	Incorrect scanner status. Please check the paper path and reload the media.
51-2	(R)	Check Sense Info
51-3	(R)	Unknown ASPI error
51-4	(R)	Unexpected number of byte received from scanner
51-5	(R)	ASPI call never completed
51-6	(R)	WaitForObject failed
51-7	(R)	ASPI abandoned
51-8	(R)	It was not possible to allocate a sync object
51-9	(R)	It was not possible to get/set the timeout inside the ASPI driver
51-10	(R)	Parameter error in CTX_SCAN call
51-11	(R)	CTX_SCAN could not find a SCSI interface board
51-12	(U)	The driver for the scanner can not be found. Please reinstall the software to correct the issue.
51-13	(R)	A SCSI protocol error was detected
51-14	(R)	An operating system error was detected
51-15	(R)	The IO command has not yet completed
51-16	(R)	An internal CTX_xxx driver error occured
51-17	(R)	The driver specified was to old
51-18	(U)	No supported scanner was found. Please verify that your scanner is properly connected, and then retry the operation.
51-19	(U)	The driver for the scanner can not be found. Please reinstall the software to correct the issue.
51-20	(R)	It was not possible to close the library, because a scanner is not closed
51-21	(R)	The calling program tried to open an already open scanner
51-22	(R)	The calling program tried to do I/O on a closed scanner
51-23	(R)	The calling program tried to close an already closed scanner
51-24	(R)	The calling program tried to open an unknown handle
51-25	(R)	The STI thread failed to return within 30 secs
51-26	(U)	Internal command error in driver. Please restart application or system.
51-27	(U)	Windows failed to lock STI/WIA device. Please reboot your system.
51-28	(U)	Windows failed to unlock STI/WIA device. Please reboot your system.
51-29	(U)	The connection to the scanner have been lost. Please restart the application.
51-30	(U)	Unable to find scanner. Please check cabling between scanner and PC and restart the application. Alternatively restart your system.
51-31	(U)	The scanner is currently reserved by another application or user. Please wait for the reservation to expire.
51-32	(U)	The operation was aborted due to an internal Windows Error. Please restart the application.

Error Code	Corrective Action	Description
WIDEsystem (WS)		
57-1	(U)	Unable to read the timer settings in the scanner. Please remove any loaded media from the scanner, and switch back and forth between this tab and another tab.
57-2	(R)	Cannot read timer settings.
57-3	(U)	The current timer values stored in the scanner are invalid. Please select new values and press the Apply button.
57-4	(U)	The On time must be before the Off time. Please make a new selection.
57-5	(R)	Scanner timer write operation failed.
57-6	(R)	Scanner timer read operation failed.
57-7	(R)	Scanner timer write operation failed.
57-8	(R)	The scanner does not support software controlled powering up/down.
57-9	(U)	Unable to read the time from the scanner. Please remove any loaded media from the scanner.
57-10	(U)	Unable to write the time to the scanner. Please remove any loaded media from the scanner.
57-11	(U)	ASPI must be installed for %s to work on NT
57-12	(U)	The driver for the scanner can not be found. Please reinstall the software to correct the issue.
57-13	(W)	The language file is not the correct version. Please reinstall the software to correct the issue.
Scanner		
100-118	(U)	Unable to communcate with the scanner. Please check the connection to the scanner.
		Troubleshooting sequence:
		1. User interaction.
		2. PC (cable, PC hardware/software etc.)
		3. Interface board (IMx).
100-119	(R)	Invalid SCSI command
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-120	(R)	Invalid value in SCSI CDB
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-121	(R)	Invalid SCSI parameter list length
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-122	(R)	Invalid SCSI parameter field
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-123	(R)	Unsupported SCSI parameter
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-124	(R)	Invalid SCSI parameter value
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-125	(U)	Incorrect scanner status. Please check the paper path and reload the media.
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-126	(R)	SCSI time-out
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-127	(U)	The scanner keyboard was used during communication with the scanner.
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. User interaction.
100-128	(U)	The scanner has paper jam. Please reload the media.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Lamp and Motor driver board (LMx)
		4. Switch Mode Power Supply (SMPS)
		5. Main controller board (SUx).
100-129	(U)	The scanner does not support this test command in normal mode. Please restart test program.
		Troubleshooting sequence:
		1. User interaction.
100-130	(U)	The scanner does not support this command in test mode. Please turn off the scanner, and turn it on again.
		Troubleshooting sequence:
		1. User interaction.
100-131	(U)	The scanner is initializing. Please retry the operation when the scanner has finished initializing.
		Troubleshooting sequence:
		1. User interaction.
100-132	(U)	The scanner is warming up. Please retry the operation when the scanner has finished warming up.
		Troubleshooting sequence:
		1. User interaction.
100-133	(U)	The scanner cannot reverse the media while the paper guide is in extended position. Please reload the media manually.
		Troubleshooting sequence:
		1. User interaction.
100-134	(U)	The scanner is calibrating. Please retry the operation when the scanner has finished calibrating.
		Troubleshooting sequence:
		1. User interaction.
100-135	(R)	Invalid firmware CRC
		Troubleshooting sequence:
		1. User interaction.
		2. Main controller board (SUx).
100-136	(U)	The scanner is on standby. Please turn on the scanner and retry the operation when the scanner is ready.
		Troubleshooting sequence:
		1. User interaction.
100-137	(R)	Invalid identify message
		Troubleshooting sequence:
		1. Firmware.
100-138	(R)	Logical unit not supported
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-139	(R)	PROCESSOR EXCEPTION 0, divide by zero
		Troubleshooting sequence:
		1. Firmware.
100-140	(R)	PROCESSOR EXCEPTION 1, debug
		Troubleshooting sequence:
		1. Firmware.
100-141	(R)	PROCESSOR EXCEPTION 2, non-maskable interrupt
		Troubleshooting sequence:
		1. Firmware.
100-142	(R)	PROCESSOR EXCEPTION 3, break point
		Troubleshooting sequence:
		1. Firmware.
100-143	(R)	PROCESSOR EXCEPTION 4, overflow

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Firmware.
100-144	(R)	PROCESSOR EXCEPTION 5, bound
		Troubleshooting sequence:
		1. Firmware.
100-145	(R)	PROCESSOR EXCEPTION 6, invalid opcode
		Troubleshooting sequence:
		1. Firmware.
100-146	(R)	PROCESSOR EXCEPTION 7, device not available
		Troubleshooting sequence:
		1. Firmware.
100-147	(R)	PROCESSOR EXCEPTION 8, double fault
		Troubleshooting sequence:
		1. Firmware.
100-148	(R)	PROCESSOR EXCEPTION 9, coprocessor segment overrun
		Troubleshooting sequence:
		1. Firmware.
100-149	(R)	PROCESSOR EXCEPTION 10, invalid TSS
		Troubleshooting sequence:
		1. Firmware.
100-150	(R)	PROCESSOR EXCEPTION 11, segment not present
		Troubleshooting sequence:
		1. Firmware.
100-151	(R)	PROCESSOR EXCEPTION 12, stack fault
		Troubleshooting sequence:
		1. Firmware.
100-152	(R)	PROCESSOR EXCEPTION 13, protection fault
		Troubleshooting sequence:
		1. Firmware.
100-153	(R)	PROCESSOR EXCEPTION 14, page fault
		Troubleshooting sequence:
		1. Firmware.
100-214	(U)	The scanner's smart card is either invalid or missing. Check that the smart card has been correctly inserted into the card slot, and that it is a valid type for the scanner.
		Troubleshooting sequence:
		1. User interaction.
		2. Smart Card Reader board (CRx).
		3. Main controller board (SUx).
		4. Related cabling.
100-1000	(R)	No sense information
100-1001	(U)	Please insert media in the scanner.
		Troubleshooting sequence:
		1. User interaction.
100-1002	(U)	Please reload the media.
		Troubleshooting sequence:
		1. User interaction.
100-1003	(U)	The scanner operation was interrupted by a user.
		Troubleshooting sequence:
		1. User interaction.
100-1004	(U)	Media is currently being loaded by the scanner. Please retry the operation when the media has been loaded.
		Troubleshooting sequence:
		1. User interaction.
100-1005	(U)	Media is currently being positioned by the scanner. Please retry the operation when the media has been positioned.
		Troubleshooting sequence:
		1. User interaction.

Error Code	Corrective Action	Description
100-1006	(U)	The scanner has paper jam. Please reload the media.
		Troubleshooting sequence:
		1. User interaction.
100-1007	(U)	The scanner cannot reverse the media while the paper guide is in extended position. Please reload the media manually.
		Troubleshooting sequence:
		1. User interaction.
100-1008	(U)	The scanner is calibrating. Please retry the operation when the scanner has finished calibrating.
		Troubleshooting sequence:
		1. User interaction.
100-1009	(U)	The scanner's reject bin is either full or closed. Please inspect it before retrying the operation.
		Troubleshooting sequence:
		1. User interaction.
100-1010	(R)	Read past end of medium
		Troubleshooting sequence:
		1. User interaction.
100-1011	(R)	Read past beginning of medium
		Troubleshooting sequence:
		1. User interaction.
100-2000	(U)	The scanner is powering up. Please wait until the scanner is ready and retry the operation.
		Troubleshooting sequence:
		1. User interaction.
100-2001	(U)	Incorrect scanner status. Please check the paper path and reload the media.
		Troubleshooting sequence:
		1. User interaction.
100-2002	(U)	The scanner does not support this test command in normal mode. Please restart test program.
		Troubleshooting sequence:
		1. User interaction.
100-2003	(U)	The scanner does not support this command in test mode. Please turn off the scanner, and turn it on again.
		Troubleshooting sequence:
		1. User interaction.
100-2004	(R)	Read past end of tile
100-2005	(R)	Time-out on request
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-2006	(R)	SOEM time-out
100-2007	(R)	No active PCEPC mode
100-2008	(R)	Error in PCEPC communication
100-2009	(R)	Fatal error in OS
		Troubleshooting sequence:
		1. Firmware.
100-2010	(R)	Fatal error in SCSI-system
100-2011	(R)	Fatal Error in firmware
		Troubleshooting sequence:
		1. Firmware.
100-2012	(U)	The scanner's smart card is either invalid or missing. Check that the smart card has been correctly inserted into the card slot, and that it is a valid type for the scanner.
		Troubleshooting sequence:
		1. User interaction.
100-2013	(U)	The scanner's smart card is not a valid type for this scanner. Please replace it with a valid card.
		Troubleshooting sequence:
		1. User interaction.
100-2014	(U)	The scanner is on standby. Please turn on the scanner and retry the operation when the scanner is ready.
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. User interaction.
100-2015	(U)	The scanner did not find any Hollerith data on the aperture card. Please check that the card is valid and correctly inserted.
		Troubleshooting sequence:
		1. User interaction.
100-2016	(U)	The scanner cover is open. Close it before retrying the operation.
		Troubleshooting sequence:
		1. User interaction.
100-3000	(U)	The firmware was not downloaded properly. Please try to download the firmware again.
		Troubleshooting sequence:
		1. User interaction.
		2. Main controller board (SUx).
100-3001	(U)	Unknown firmware error
		Troubleshooting sequence:
		1. User interaction.
100-3002	(U)	Unable to adjust camera A up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3003	(U)	Unable to adjust camera B up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3004	(U)	Unable to adjust camera C up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3005	(U)	Unable to adjust camera D up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3006	(U)	Unable to adjust camera E up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3007	(U)	Unable to adjust camera F up. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3008	(U)	Unable to adjust camera A down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3009	(U)	Unable to adjust camera B down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3010	(U)	Unable to adjust camera C down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3011	(U)	Unable to adjust camera D down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3012	(U)	Unable to adjust camera E down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. User interaction.
100-3013	(U)	Unable to adjust camera F down. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3014	(U)	Unable to stitch cameras A and B. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3015	(U)	Unable to stitch cameras B and C. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3016	(U)	Unable to stitch cameras C and D. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3017	(U)	Unable to stitch cameras D and E. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3018	(U)	Unable to stitch cameras E and F. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3019	(U)	Error calibrating. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3020	(U)	Error calibrating camera A, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3021	(U)	Error calibrating camera A, green. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3022	(U)	Error calibrating camera A, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3023	(U)	Error calibrating camera B, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3024	(U)	Error calibrating camera B, green. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3025	(U)	Error calibrating camera B, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3026	(U)	Error calibrating camera C, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3027	(U)	Error calibrating camera C, green. Please clean the white background and the glass plate.

Error Code	Corrective Action	Description
		Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3028	(U)	Error calibrating camera C, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3029	(U)	Error calibrating camera D, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3030	(U)	Error calibrating camera D, green. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3031	(U)	Error calibrating camera D, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3032	(U)	Error calibrating camera E, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3033	(U)	Error calibrating camera E, green. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3034	(U)	Error calibrating camera E, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3035	(U)	Error calibrating camera F, red. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3036	(U)	Error calibrating camera F, green. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3037	(U)	Error calibrating camera F, blue. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
100-3038	(R)	Error programming multiplier FLASH
100-3039	(R)	Controller error: Dither RAM R/W error
100-3040	(R)	Controller error: Amp. RAM R/W error
100-3041	(R)	Controller error: Unexpected external int
100-3042	(R)	Controller error: Unexpected serial port int
100-3043	(R)	Controller error: Unexpected software timer int
100-3044	(R)	Controller error: Unexpected HSO int
100-3045	(R)	Controller error: Unexpected HSI DATA int
100-3046	(R)	Controller error: Unexpected ad int
100-3047	(R)	Controller error: Unexpected timer overflow int
100-3048	(R)	Controller error: Unexpected shftfull int
100-3049	(R)	Controller error: Program terminated
100-3050	(R)	Controller error: In main state machine
100-3051	(S)	The scanner's ID switch has been set to an invalid value. Please change switch setting.
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. Smart Card Reader board (CRx).
		2. Main controller board (SUx).
		3. Related cabling.
100-3052	(S)	SCB board error
100-3053	(S)	CCB/CCE board error
100-3054	(S)	Unable to write to EEPROM/FLASH
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-3055	(S)	Flash error: Vpp low
100-3056	(S)	Flash error: Unable to erase
100-3057	(S)	Flash error: Unable to program
100-3058	(S)	SCU board error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-3059	(S)	CBx board error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-3060	(S)	PPU board error
100-3061	(S)	IMx board error
		Troubleshooting sequence:
		1. Interface board (IMx).
100-3062	(U)	Fan error
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Lamp and Motor driver board (LMx)
100-3063	(U)	The scanner's replacable lamp cartridge is detached. Check that it is intact and correctly inserted.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
100-3064	(R)	LMx board error
		Troubleshooting sequence:
		1. Lamp and Motor driver board (LMx)
		2. Main controller board (SUx).
		3. Related cabling.
100-3065	(R)	Unable to communicate with MDx board.
		Troubleshooting sequence:
		1. ATAC controller board (MDx).
		2. Main controller board (SUx).
		3. Related cabling.
100-3066	(R)	Unable to use DSP
100-3067	(R)	DSP hardware error
100-3068	(S)	SKx, SKx board error
		Troubleshooting sequence:
		1. Operator Panel board (SKx).
100-3069	(U)	The scanner lamp cover is open. Please close it and retry the operation.
		Troubleshooting sequence:
		1. User interaction.
100-4001	(U)	No supported scanner could be found. Check that the scanner is turned on and connected.
		Troubleshooting sequence:
		1. User interaction.
100-4002	(R)	Parameter list length error
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)

Error Code	Corrective Action	Description
		2. Firmware.
100-4003	(R)	Invalid command operation code
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-4004	(R)	Logical unit not supported
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
100-4005	(R)	Invalid value in CDB
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
100-4006	(R)	An invalid field in the parameter list was set to a value
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
100-4007	(R)	An unsupported field in the parameter list was set to a value
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
100-4008	(R)	A field in the parameter list was set to an invalid value
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
100-4009	(R)	Invalid bits in identify message
		Troubleshooting sequence:
		1. Firmware.
100-5000	(R)	Command phase error
		Troubleshooting sequence:
		1. Firmware.
		2. PC (cable, PC hardware/software etc.)
		3. Interface board (IMx).
100-5001	(R)	Overlapped commands attempted
		Troubleshooting sequence:
		1. Firmware.
		2. PC (cable, PC hardware/software etc.)
		3. Interface board (IMx).
100-5002	(U)	The scanner operation was interrupted by a user.
		Troubleshooting sequence:
		1. User interaction.
100-8147	(U)	The scanner's ID switch has been set to an invalid value. Please change switch setting.
		Troubleshooting sequence:
		1. Smart Card Reader board (CRx).
		2. Main controller board (SUx).
		3. Related cabling.
100-8149	(U)	The scanner's smart card is not a valid type for this scanner. Please replace it with a valid card.
		Troubleshooting sequence:
		1. User interaction.
100-8208	(U)	Keyboard check failed.
		Troubleshooting sequence:
		1. User interaction.
100-8220	(U)	The scanner's replacable lamp cartridge is detached. Check that it is intact and correctly inserted.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
100-8223	(U)	The scanner lamp cover is open. Please close it and retry the operation.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
100-20086	(S)	Unable to communicate with MDx board.

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. ATAC controller board (MDx).
		2. Main controller board (SUx).
		3. Related cabling.
100-20087	(U)	Unable to perform paper guide movement (ATAC). Please turn scanner off and on.
		Troubleshooting sequence:
		1. User interaction.
		2. ATAC controller board (MDx).
		3. Main controller board (SUx).
100-20219	(S)	Fan error.
		Troubleshooting sequence:
		1. Related mechanical parts.
		2. Lamp and Motor driver board (LMx)
100-20221	(S)	LMx, board error.
		Troubleshooting sequence:
		1. Lamp and Motor driver board (LMx)
		2. Main controller board (SUx).
		3. Related cabling.
100-30140	(U)	Correction of Camera A failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30141	(U)	Correction of Camera B failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30142	(U)	Correction of Camera C failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30143	(U)	Correction of Camera D failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30222	(U)	The scanner lamp needs replacement.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
100-30240	(U)	Correction of Camera A failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).

Error Code	Corrective Action	Description
100-30241	(U)	Correction of Camera B failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30242	(U)	Correction of Camera C failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-30243	(U)	Correction of Camera D failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32144	(U)	Stitching between Camera A and B failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32145	(U)	Stitching between Camera B and C failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32146	(U)	Stitching between Camera C and D failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32244	(U)	Stitching between Camera A and B failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32245	(U)	Stitching between Camera B and C failed. Please clean the white background and the glass plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-32246	(U)	Stitching between Camera C and D failed. Please clean the white background and the glass

Error Code	Corrective Action	Description
		plate. Then run your maintenance software.
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-40035	(S)	CBx, Camera A not found
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40036	(S)	CBx, Camera B not found
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40037	(S)	CBx, Camera C not found
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40038	(S)	CBx, Camera D not found
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40039	(S)	CBx, Camera A AMP RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40040	(S)	CBx, Camera B AMP RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40041	(S)	CBx, Camera C AMP RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40042	(S)	CBx, Camera D AMP RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40043	(S)	CBx, Camera A EVEN LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40044	(S)	CBx, Camera B EVEN LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40045	(S)	CBx, Camera C EVEN LINE RAM error

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40046	(S)	CBx, Camera D EVEN LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40047	(S)	CBx, Camera A ODD LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40048	(S)	CBx, Camera B ODD LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40049	(S)	CBx, Camera C ODD LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40050	(S)	CBx, Camera D ODD LINE RAM error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40075	(S)	CBx, FPGA CB status error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40076	(S)	CBx, FPGA CB done error
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40084	(S)	CBx, Camera cables misplaced
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
100-40134	(S)	Unable to basic calibrate
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40135	(S)	Unable to calibrate analog offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40136	(S)	Unable to calibrate analog gain

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40137	(S)	Unable to calibrate pixel offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40138	(S)	Timed-out on calibrating analog part
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40139	(S)	An IT8 white patch was 0
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40170	(S)	Camera A, Unable to calibrate analog offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40171	(S)	Camera B, Unable to calibrate analog offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40172	(S)	Camera C, Unable to calibrate analog offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40173	(S)	Camera D, Unable to calibrate analog offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40174	(S)	Camera A, Unable to calibrate analog gain
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40175	(S)	Camera B, Unable to calibrate analog gain
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).

Error Code	Corrective Action	Description
		3. Main controller board (SUx).
		4. Related cabling.
100-40176	(S)	Camera C, Unable to calibrate analog gain
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40177	(S)	Camera D, Unable to calibrate analog gain
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40178	(S)	Camera A, Unable to calibrate pixel offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40179	(S)	Camera B, Unable to calibrate pixel offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40180	(S)	Camera C, Unable to calibrate pixel offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40181	(S)	Camera D, Unable to calibrate pixel offset
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40182	(S)	Camera A, Timed-out, calibrating analog part
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40183	(S)	Camera B, Timed-out, calibrating analog part
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40184	(S)	Camera C, Timed-out, calibrating analog part
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40185	(S)	Camera D, Timed-out, calibrating analog part

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40186	(S)	Camera A, Unable to calibrate ext. DAC
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40187	(S)	Camera B, Unable to calibrate ext. DAC
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40188	(S)	Camera C, Unable to calibrate ext. DAC
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-40189	(S)	Camera D, Unable to calibrate ext. DAC
		Troubleshooting sequence:
		1. Switch Mode Power Supply (SMPS)
		2. Camera board (CBx).
		3. Main controller board (SUx).
		4. Related cabling.
100-50017	(S)	SUx, Register 1 error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50018	(S)	SUx, Register 2 error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50019	(S)	SUx, Register 3 error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50020	(S)	SUx, Register 6 error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50021	(S)	SUx, Register 8 error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50022	(S)	SUx, FPGA01 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50023	(S)	SUx, FPGA03 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50024	(S)	SUx, FPGA04 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50025	(S)	SUx, FPGA05 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50026	(S)	SUx, FPGA06 register error

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50027	(S)	SUx, FPGA07 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50028	(S)	SUx, FPGA08 register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50051	(S)	SUx, DB 0 reset error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50052	(S)	SUx, DB 0 count error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50053	(S)	SUx, DB 0 data error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50054	(S)	SUx, DB 1 reset error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50055	(S)	SUx, DB 1 count error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50056	(S)	SUx, DB 1 data error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50057	(S)	SUx, CNTL RAM error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50058	(S)	SUx, LIN RAM error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50059	(S)	SUx, GAMMA RAM error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50060	(S)	SUx, INDEX RAM error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50061	(S)	SUx, LUT ATBS error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50062	(S)	SUx, LUT A error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50063	(S)	SUx, LUT B error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50064	(S)	SUx, LUT C error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50065	(S)	SUx, Color space converter data error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50066	(S)	SUx, Color space converter coefficient error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50067	(S)	SUx, Position counter reset error

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50068	(S)	SUx, Position counter count error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50069	(S)	SUx, Data path error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50070	(S)	SUx, Data path length error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50071	(S)	SUx, FPGA 8k status error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50072	(S)	SUx, FPGA 8k done error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50073	(S)	SUx, FPGA 10k status error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50074	(S)	SUx, FPGA 10k done error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50077	(S)	SUx, FPGA 6k status error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50078	(S)	SUx, FPGA 6k done error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50079	(S)	SUx, FPGA 20k status error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50080	(S)	SUx, FPGA 20k done error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50081	(S)	SUx, FPGA03 function error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50088	(S)	Hardware identification error.
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50089	(U)	Invalid firmware for this type of scanner. Please download new firmware
		Troubleshooting sequence:
		1. User interaction.
100-50090	(S)	SUx, Sector in writeable area of FLASH locked
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50091	(S)	SUx, Parameter block erasure failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50092	(S)	SUx, Parameter block write failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50093	(S)	SUx, Profile block erasure failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50094	(S)	SUx, Profile block write failed

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50095	(S)	SUx, Flash block erasure failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50096	(S)	SUx, Flash block write failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50099	(S)	SUx, Unknown flash device type
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50100	(R)	pad task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50101	(R)	pcd task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50102	(R)	pbl task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50103	(R)	err task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50104	(R)	pio task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50105	(R)	pop task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50106	(R)	psn task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50107	(R)	psc task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50108	(R)	psi task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50109	(R)	psp task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50110	(R)	pts task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50111	(R)	pto task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50112	(R)	mbPad creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50113	(R)	mbPbl creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50114	(R)	mbPcd creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50115	(R)	mbPio creation failed

Error Code	Corrective Action	Description
		Troubleshooting sequence:
		1. Firmware.
100-50116	(R)	mbPsi creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50117	(R)	mbPsp creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50118	(R)	mbPts creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50119	(R)	mbPio pending
		Troubleshooting sequence:
		1. Firmware.
100-50120	(R)	hmm out of memory
		Troubleshooting sequence:
		1. Firmware.
100-50121	(R)	hmm un-allocated memory block
		Troubleshooting sequence:
		1. Firmware.
100-50122	(R)	pop request failed, position unknown
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-50123	(R)	pop request failed, invalid command
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-50124	(R)	pio event
		Troubleshooting sequence:
		1. Firmware.
		2. Related mechanical parts.
100-50125	(R)	psi event
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
		3. Interface board (IMx).
100-50126	(R)	pcd event
		Troubleshooting sequence:
		1. Firmware.
100-50127	(R)	psc event
		Troubleshooting sequence:
		1. Firmware.
100-50128	(R)	psi message event
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
		3. Interface board (IMx).
100-50130	(R)	semPsp posted more than once
		Troubleshooting sequence:
		1. Firmware.
100-50131	(R)	psp received unknown mail
		Troubleshooting sequence:
		1. Firmware.
100-50132	(R)	mrsErrorTbl missing entry
		Troubleshooting sequence:
		1. Firmware.

Error Code	Corrective Action	Description
100-50133	(R)	unknown reboot command
		Troubleshooting sequence:
		1. Firmware.
100-50190	(R)	pbl received invalid mail
		Troubleshooting sequence:
		1. Firmware.
100-50191	(R)	mbPss creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50192	(R)	pss task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50193	(R)	mbPss pending
		Troubleshooting sequence:
		1. Firmware.
100-50194	(R)	pss event
		Troubleshooting sequence:
		1. Firmware.
100-50195	(R)	stitch write failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50196	(R)	pmb validation failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50197	(R)	pointer out of range
		Troubleshooting sequence:
		1. Firmware.
100-50198	(R)	Incorrect camera board. Please check all camera board types.
		Troubleshooting sequence:
		1. Firmware.
100-50199	(S)	Incorrect SUx/CBx combination. Please validate the combination for this scanner.
		Troubleshooting sequence:
		1. Camera board (CBx).
		2. Main controller board (SUx).
		3. Related cabling.
		4. Firmware.
100-50200	(R)	invalid timeout task
		Troubleshooting sequence:
		1. Firmware.
100-50201	(R)	invalid data length
		Troubleshooting sequence:
		1. PC (cable, PC hardware/software etc.)
		2. Firmware.
100-50202	(R)	semPsp already owned by this SCSI unit
		Troubleshooting sequence:
		1. Firmware.
100-50203	(R)	semPsp not released
		Troubleshooting sequence:
		1. Firmware.
100-50204	(R)	new failed, out of memory
		Troubleshooting sequence:
		1. Firmware.
100-50206	(R)	Light profile flash space overrun
		Troubleshooting sequence:
		1. Firmware.
100-50207	(R)	pkb task creation failed
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. Firmware.
100-50209	(R)	ppw task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50210	(R)	mbPpw creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50211	(R)	pus task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50212	(R)	mbPus creation failed
		Troubleshooting sequence:
		1. User interaction.
		2. PC (cable, PC hardware/software etc.)
		3. Firmware.
		4. Interface board (IMx).
100-50213	(R)	pus event
		Troubleshooting sequence:
		1. Firmware.
100-50214	(R)	psp task delete failed
		Troubleshooting sequence:
		1. Firmware.
100-50215	(R)	pfi task creation failed
		Troubleshooting sequence:
		1. Firmware.
100-50216	(R)	mbPfi creation failed
		Troubleshooting sequence:
		1. User interaction.
		2. PC (cable, PC hardware/software etc.)
		3. Firmware.
		4. Interface board (IMx).
100-50217	(R)	pfi event
		Troubleshooting sequence:
		1. User interaction.
		2. Related mechanical parts.
		3. Camera board (CBx).
		4. Main controller board (SUx).
100-50300	(R)	Unable to set scanner model
		Troubleshooting sequence:
		1. Firmware.
100-50301	(R)	Unable to set lost pixels
		Troubleshooting sequence:
		1. Firmware.
100-50302	(U)	Invalid FRAM contents. Try downloading new firmware.
		Troubleshooting sequence:
		1. User interaction.
100-50303	(U)	Scanner has no serial number.
		Troubleshooting sequence:
		1. User interaction.
100-50500	(S)	SUx, 386 CPU error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50501	(S)	SUx, CPU FIFO error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50502	(S)	SUx, Ethernet PHY chip error
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. Main controller board (SUx).
100-50503	(S)	SUx, USB2 chip error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50504	(S)	SKx, SKx board error
		Troubleshooting sequence:
		1. Operator Panel board (SKx).
100-50505	(S)	SUx. FRAM Error. Try downloading new firmware.
		Troubleshooting sequence:
		1. User interaction.
		2. Main controller board (SUx).
100-50506	(S)	SUx, DoubleBuffer DMA Error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50507	(S)	SUx, Main FPGA load failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50508	(S)	SUx, Camera FPGA load failed
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50509	(S)	SUx, Main FPGA register error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50510	(S)	SUx, Invalid Ethernet MAC address
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50511	(S)	SUx, Ethernet PHY connector error or missing loopback plug
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50512	(S)	SUx, Ethernet MAC-PHY interface error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-50513	(S)	SUx. RTC chip error
		Troubleshooting sequence:
		1. Main controller board (SUx).
100-60029	(S)	IMx, SCSI 0 reset error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60030	(S)	IMx, SCSI 0 register error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60031	(S)	IMx, SCSI 0 FIFO error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60032	(S)	IMx, SCSI 1 reset error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60033	(S)	IMx, SCSI 1 register error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60034	(S)	IMx, SCSI 1 FIFO error
		Troubleshooting sequence:

Error Code	Corrective Action	Description
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60082	(S)	IMx, USB chip error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60083	(S)	IMx, wrong board version installed
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).
100-60085	(S)	IMx, 1394 chip error
		Troubleshooting sequence:
		1. Interface board (IMx).
		2. Main controller board (SUx).